

**£39 per month**  
inc. maint.  
LA34  
MBS Rentals  
Tel: 09323-53151

## NEWS IN BRIEF

## Euro database market growth

THE international market research firm Input has predicted that the European market for on-line databases could approach that of the US by 1985 at an estimated \$4.3 billion. Input believes that videotext, viewdata, Burenet, PTT packet switched networks and other information industry projects with government backing will boost the database market from its present \$150 million into a prime market.

## GaAs saving

A TECHNIQUE that greatly reduces the cost of gallium arsenide has been developed by scientists at the Massachusetts Institute of Technology. Called Clef, the approach uses a substrate of GaAs bonded to glass and thus reduces the amount of GaAs required.

## PDP-11 add-in

DIGITAL Equipment users could be interested in what is said to be the first single board 256K-byte add-in memory for the PDP-11/44. Called the DR-144S it is manufactured in the US by Dataram Corp of Cliffside Park, New Jersey, which says that it is completely compatible with DEC's MS11-M memory module for the 11/44.

## Training aid sought

APPLICATIONS to the EEC for funding microtechnology training schemes have been made by the counties of Hereford and Worcester. Common market officials in Brussels are considering a request for £1,400,000 which would be used to retrain unemployed under-25s in microelectronics.

## Computer security

AS part of security precautions after recent bomb blasts, Warwickshire police are to move communications and computer equipment into parts of police stations which are most difficult for intruders to reach.

## Japanese market

The semiconductor manufacturing equipment market in Japan is now half taken up by Japanese producers. Five years ago the US had 75 per cent of the market in Japan. It still has 75 per cent of the total world market, which is growing at between 20 per cent and 30 per cent a year.

## ICL looks for Japanese link

FORMER systems analyst William Thomas is making a good recovery, said a hospital spokesman after an 8-hour heart transplant operation at Papworth Hospital, Cambridge. The 25-year-old Thomas, of Queensway, Birmingham, had been the victim of a heart attack, which had caused him to collapse in a supermarket. He had been in intensive care for two weeks.

Telecom HQ

THE new Coventry area headquarters for British Telecom in the 72,000 square foot Building One, which will be the UK's main telecoms hub for 15 years. Over 1,000 staff are expected to move into the 10-storey building in October. The building is a communications system and telephone network installed.

## Buyer for ICL's Winsford plant

THE disposal of ICL's factory at Winsford, Cheshire, has been announced just as the company's severance pay terms have been accepted by the unions representing the 1,450 redundant Winsford workers.

Taking over the plant is United Peripherals, the joint disc drive manufacturing operation set up in 1979 by Data Recording Instruments and Control Data subsidiary Magnetic Peripherals Inc. The deal does not include an undertaking by UPL to employ any of the ICL staff, although jobs should be available for some of them later this year.

The takeover of the Winsford factory will save both time and money for UPL, which originally planned to build a 15,000 square foot plant at Crewe near its existing temporary premises where 450 staff are employed at the moment.

If these wish to stay with UPL they will have to travel to Winsford, which is eight miles from Crewe and where re-equipping by UPL will follow ICL's vacation of the site in July.

By the end of 1981, the UPL workforce at Winsford is expected to stand at 800, including some staff transferred from the other UPL manufacturing operation at Staines which is being run down as part of the company's rationalisation plans.

Most of the 380 Staines workforce is expected to accept redundancy rather than move to Winsford, so the disc drive manufacturer is likely to have jobs available for a lot of former ICL employees.

The activities of DRI outside UPL, such as its printer manufacturing operation, will remain at Staines.

UPL is 70% owned by Control Data and embraces most of the big computer manufacturer's disc drive research and manufacturing

activities. MPI owns only 24% of UPL, the rest being held by National Enterprise Board-owned DRI, but it exerts a dominant influence over its management, mainly because of its substantial R & D resources in the US.

The first two UPL products are both MPI-developed units that the company already builds at its plant in Oklahoma City. They are the 9427H cartridge disc drive which comes with one fixed and one removable platter, each holding six megabytes, and the 9448 cartridge module drive which combines a 16 megabyte front loading cartridge with 16, 48 or 80 megabytes of fixed disc capacity.

Funded by the NEB to the tune of £8 million, UPL builds drives for sale on a world-wide basis both by DRI and the OEM side of Control Data. The transfer value of its products in 1980 was £17 million, according to Control Data, and a figure of £28 million is planned for 1981.

It is to use the system for linking multiple micros and minis and later plans to add mainframes.

Thame Systems was chosen distributor because it had already become top UK distributor for UK disc manufacturer, and Charlie Bass, newly-appointed UK director of Thame Systems, formerly Marconi Systems, of Thame in Oxfordshire.

It is to be the first UK customer for Net/One, the local networking system announced last year by California-based Ugemann-Bass (CW, October 1980).

BT's order is for a £1.5 million three-node pilot system with serial ports, and it is due to be delivered in the first week in January by Ugemann-Bass.

The activities of DRI outside UPL, such as its printer manufacturing operation, will remain at Staines.

Most of the 380 Staines workforce is expected to accept redundancy rather than move to Winsford, so the disc drive manufacturer is likely to have jobs available for a lot of former ICL employees.

The activities of DRI outside UPL, such as its printer manufacturing operation, will remain at Staines.

UPL is 70% owned by Control Data and embraces most of the big computer manufacturer's disc drive research and manufacturing

## GEC plans satellite comms service

Rush Deliveries Are Our Speciality  
NATIONAL WORKS  
HALL STREET, DUDLEY  
WEST MIDLANDS  
DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Contact

FORUM design

manufacturers of High Quality

COMPUTER FORMS

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

to ensure first class service, top quality total dependability

Rush Deliveries Are Our Speciality

NATIONAL WORKS

HALL STREET, DUDLEY

WEST MIDLANDS

DUDLEY (0304) 213081

# COMPUTER WEEKLY

## COMPUTERVIEW

### Japanese U-turn

WITH the announcement that yet another Japanese company is to launch its personal computer on the UK and European market, it seems the Japanese are keeping to their proven rule — persistence pays in the end. Despite opposition from national governments, Japanese exports of personal computers into EEC countries have risen from almost zero to 1,000 units a month in the last year.

Now, after constant denials that the PC-8000 would be introduced to the European market, Nippon Electric has done a U-turn and plans to launch a personal computer system based on the PC-8000 in the UK and France at the end of this year.

The PC-8000 was revealed to visitors to last year's Comdex. Over 300 inquiries came from dealers, distributors and visitors, according to NEC, and this is the factor that persuaded the company to alter its plans.

Already, three other relatively small Japanese companies have become exporters to Europe in the personal computer field. They are Sord Computer Systems, Al Electronics and Logic Systems International, all based in Tokyo. Intentions of all three are to become exporters to the US early this year, initially in small quantities. However, they expect sales to increase rapidly as they have done in Europe.

One factor that must be causing a great deal of anguish to Japanese manufacturers is

import restrictions. The quality and reliability of Japanese products make them very competitive, and the inevitable reaction of European countries is to impose restrictions, as France is threatening to do. France has already warned the Japanese government (mentioning Sord Computer Systems in particular) to restrain its exports.

But the Japanese persist. One good way of overcoming import restrictions is to set up an assembly plant in an EEC country, and Sord has done just that.

Assembly of its microcomputer systems has begun at a small factory in Dublin. The units are shipped in the UK through two distributors, Exteigh Business Machines of Penzance and Midas Computers. According to Sord, most of the assembled units from Dublin go into France, to two major customers, the French Ministry of Defence and the French National Bank. (No wonder France wants to impose restrictions!)

Which other Japanese companies will follow Sord? NEC could easily, as it already plans a UK semiconductor plant. Only four months ago it was announced that NEC was planning a 64K RAM and 16-bit microcomputer plant at a site in Livingston, near Edinburgh. It will operate under the name of NEC Semiconductor UK and be fully operational by 1982.

Even more ironic is that Livingston is a "special development area" and NEC will receive financial assistance from our government. In a way the UK, far from strengthening its indigenous personal computer manufacturing industry, is financially assisting a Japanese company to take a part share in the market.

### Viewdata move

A WELL OVERDUE move for members of the emerging viewdata and teletext industries to work together got under way last week at a conference organised by the Department of Industry.

The next stage is to get those members, whose previous marketing efforts were described by Information Technology Minister Kenneth Baker as being unco-ordinated, to agree on a common strategy, despite the fact that many of them are rivals.

Last year the DoI brought the teletext industry together in an awareness campaign which started with 15% of adult consumers knowing about teletext and reputedly finished with 50% knowing. At the same time, sales of teletext sets reached 120,000.

This year the field has been broadened to include viewdata, which has already had a big push from British Telecom and is beginning to enjoy success in small specialised markets, as well as continuing sales overseas.

With any luck the field will quickly be broadened further to bring together other aspects of information technology. Perhaps cable television and two-way radio will be seen to be related — after all, they are an important part of the US market and a major target for UK-based viewdata and teletext industries.

And since the export success of industries is expected to benefit the development of the home market, perhaps it will be possible to persuade British Telecom to allow Prestel terminals to access Packet Switched Service, communicate with each other symmetrically at a variety of speeds, call each other and answer automatically, attach to computers and other devices and link to radio telephone services for mobile use — in fact, be the of a multi-function terminal.

The Telecommunications Council is at creating a forum for interests in computer, mobile radio and telecommunications companies and their users may still succeed.

Other focal points for hopeful are: The DoI's information technology and its enthusiastic new British Telecom's telematics division; Home Office's working party on automation; Secretary, due shortly, on the liberalisation of British Telecom's poli-

But when will these combined efforts bring us Space Invaders on view? Will the viewdata industry see any real in the International Standards Organisation's work on Open Systems interconnection; the ability to connect anything to anything? And can the focus of attention move on from the rich pickings of terminal equipment market to the market for services to which cheap multi-point terminals can provide widespread access?

tion and unemployment. By 1990 there will be a 5% reduction in the number of bank branches and a 10% reduction in bank staff throughout Europe. BIFU says.

It has been predicted before, says BIFU, that the number of front office workstations in bank branches in Europe will more than double during the next five years. Some 22% of customer contact positions in European banks are now automated, and this number is expected to rise by 44% by 1985 and over 60% by 1990.

Systemsolve's turnover is expected to grow from £2.45 million in its financial year ended September 30, 1980, to £3 million in the current year.

Hunting Gibson chalked up a pre-tax profit of £1.5 million on a

£6 million turnover in the first six months of 1980 compared with £2.9 million on £12.4 million in 1979.

Hunting Gibson is one of three separate publicly quoted Hunting companies with engineering interests and historical connections.

BOC's interests in the computer services business are among the biggest in Europe. Apart from BOC Datafile it owns Software Sciences and the personnel company Knight Computer Services.

### Electron beams supplant heat

A BRITISH company, Lintech Instruments of Cambridge, has developed electron beam equipment for use in the manufacture of semiconductor devices much faster than the present thermal techniques. The electron-beam annealer, called Sezu in its production form, will have a throughput of 200 wafers per hour for ion-implanted semiconductor materials.

### LETTERS to the EDITOR

### Separating information from raw data

SEE from the articles by Messrs Michie and Sutcliffe (CW, January 8) that there is still no shortage of gentlemen to discuss earnestly problems of the "number-of-angels-that-can-dance-on-the-head-of-a-needle" type.

As a new reader, I have not had the pleasure of seeing Professor Michie's definition of "information" but from their discussions it would appear that they are using "information" in its technical sense.

This does not mean that it may not be "information" to someone else. How often do managers begin to suspect that some vital piece of information never reached them because someone else did not think them as useful.

Whether or not computers can ever have infinite capacity has no real relevance to their usefulness to a finite population of people.

Furthermore, prolonged discussion about whether the computer creates or merely assists the collection and managerial "information"?

In these circumstances, a better definition of information is given by Beer as "That which changes 'i.e.' causes us to behave differently from how we would have behaved/decided without specific input."

The key is that information is managerially useful.

How does information in the managerial sense relate to information in the M.I.6 sense?

The manager's everyday environment, which is a part of Professor Michie's system, is a set of "certainly true" or "certainly-type" information. This may be considered to be "latent" data in managerial terms.

As a matter of routine, request or chance, someone has to turn the environment and collects some of this latent data. In this becomes "raw data".

Someone may recognise and extract meaning out of the raw

data and it becomes information in the managerial sense.

We only really know that information has been received if someone recognises what is useful, perhaps by themselves defining what is useful. Only people can do that.

The number of people in the world is limited, as is their individual ability to extract information out of data.

If computers can be used to extend our ability to extract useful information and hence perceive meaning in our surroundings, that should be sufficient to qualify them as useful.

While this is fine for Shannon's Information Theory and for work involving thermodynamics, it is not so useful for managers concerned with everyday decision-making.

The information that Michie and Sutcliffe are discussing is only a precursor of the information the manager uses. How relevant are present users. Looking to the future, the report foresees cumulative hardware investment of £200 million by 1980 with government

computer power 20-fold over the period. British Rail Scotland has another £300,000 MARCH train description system AEI-General Signal Ltd for new Central to complete earlier installations at Motherwell.

... Some 85% of computers do not provide specific information for software purchase, it is contained in a recent NCC Computer Centre survey.

### TEN YEARS AGO

From Computer Weekly of January 21, 1971

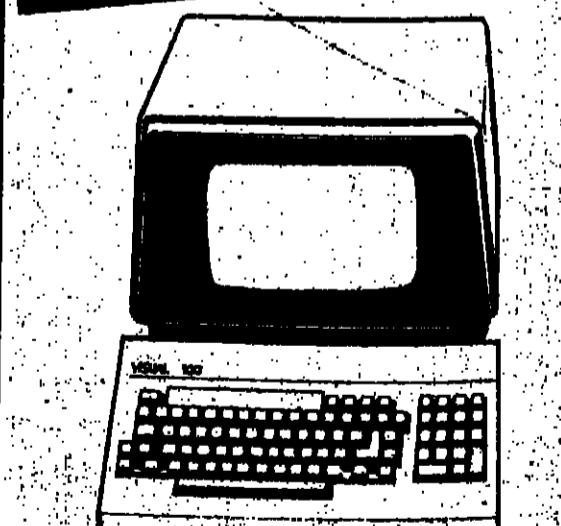
A REVEALING picture of how Whitehall and Westminster employ computers and envisage their future emerges from the long-awaited Civil Service Department report, Computers in Central Government: Ten Years Ahead, which shows the Ministry of Defence heading the list of present users. Looking to the future, the report foresees cumulative hardware investment of £200 million by 1980 with govern-

ment computer power 20-fold over the period. British Rail Scotland has another £300,000 MARCH train description system AEI-General Signal Ltd for new Central to complete earlier installations at Motherwell.

... Some 85% of computers do not provide specific information for software purchase, it is contained in a recent NCC Computer Centre survey.

### Wilkes Computing Announce the

### VISUAL 100



- VT100 Compatible
- Advanced video option is standard
- Current loop interface is standard
- Buffered printer interface option only £34
- One off end user price only £850
- OEM discounts available

Wilkes Computing

Tel (0272) 25921 Telex 449205

### Analysis of the first member of H-series

AN analysis of the IBM 3081, generally accepted as the first member of the long-awaited H-series, will be included in a two-day conference in London on February 16/17 organised by the Yankee Group.

With the title, Evolving the IBM Network, the event will also feature a talk about new aspects of IBM's Systems Network Architecture.

Other topics will cover areas such as IBM's directions in telecommunications and office technology, and its strategies for operating systems and databases.

Further information about the event can be obtained from either Al Dunn or Gwendolyn Thompson, CAC, The Yankee Group, Regal House, Lower Road, Chorleywood, Rickmansworth, Herts, WD3 5LO. Tel: Chorleywood (0972) 4714.

Timeplex alleges that Racial allowed its US-based manufacturing company to use protected Timeplex technical information and plans to develop a rival range of statistical multiplexers.

Further, it alleges that Racial broke a supposedly non-cancellable contract to buy \$1 million worth of equipment due to be delivered by the end of March, failed to pay for other purchases and misused Timeplex trademarks.

In preparation for arbitration in New York City, Timeplex — which set up a UK subsidiary early last year — has asked for court authority to question Racial employees under oath and to examine company records.

Timeplex alleges that Racial

complained by full h/w maintenance and software support and applications including order processing, word processing, sales/purchase, nominal ledger, payroll, stock control, and much more.

WATCH FOR SYSPAK/74 / 75 / 760 OR CALL NOW

### CAP chief quits for Microsoft

• From front page

conventional external loan funding.

• The current loan is on behalf of a million loan in the Eurodollar market.

• IBM has traditionally been a net generator of its own funds and taken with the surprise billion dollar 1979 borrowings, the current loan takes the company into more

ALL PACKAGES INCLUDE THIS BASIC HARDWARE AND SERVICES

11/70 CPU, 512KB, LA120<sup>TM</sup>

TS11-B 1600BPI MAGTAPE<sup>TM</sup>

DISC CONTROLLER

16 LINE MULTIPLEXER

10 x VT100<sup>TM</sup> COMPATIBLE VDUS

600 LPM BAND PRINTER

8 DISC PACKS

OPERATING SYSTEM + SYSGEN DELIVERY + INSTALLATION\*

2 x 67 MB DISC DRIVES

RSX-11M OPERATING SYSTEM

2 x 256 MB DISC DRIVES

RSX-11M OPERATING SYSTEM

2 x 67 MB DISC DRIVES

RTS/B OPERATING SYSTEM

2 x 256 MB DISC DRIVES

RTS/B OPERATING SYSTEM

£94,000

£100,000

£97,500

£103,500

ALL PLUS VAT

SYSTEK LTD

NORTH FINCHLEY LONDON N12 0AZ

SYSTEK LTD

**Downtime**  
by Chay

MANY of us have an addiction to using technical or scientific language when talking about everyday things. It can be extremely useful.

For example, I am baffled by the jams one gets in tube trains during the rush hour. People can be squashed like steam-rolled sardines near the doors, while others are standing oblivious in the middle of the cars with plenty of space around them, reading their newspapers.

One of us would ask, "Do we have a data entry failure?" to which the reply would be, "Seems to have been a breakdown in the handshake routine."

Of course the problem with this language is that you cannot use it with outsiders, but I often wish you could.

For example, I am baffled by the jams one gets in tube trains during the rush hour. People can be squashed like steam-rolled sardines near the doors, while others are standing oblivious in the middle of the cars with plenty of space around them, reading their newspapers.

There seems to be enormous friction on the movement of people, even under severe pressure gradients. The people half way in between have plenty of newton's shoving them from

one side but still they do not move. Bellows of "Move down inside!" have little effect, and I fear that explaining about the

pressure gradients would have less. Just pushing elicits nothing but indignation.

Another yawning gap in the

scientific awareness taught (or

rather not taught) in our schools. Or perhaps it's just good old British bloody-mindedness, which I gather has had a preservation order slapped on it.

Winchester disc and mag tape drive."

The nameless Northerner comments: "Payable in Monopoly money, presumably!"

Personally I find rather fascinating the idea of having to pay money for memory which isn't there.

Says the story, "Included in the price of the 24 bit system is 6 M-byte of virtual memory, a

The reaction of my colleagues

at the time was, naturally enough, "Stop quibbling, you know what we mean!" But we computer people are the world's acc quibblers, are we not?

What with virtual machines and virtual terminals, I have heard more than one data processing manager wish that he had virtual users.

**MICHIE'S PRIVATEVIEW**

## Martian information structures considered harmful

LAST Privateview left the question: what is an information structure? Also, can you create one without creating information?

The decision tree of Figure 1 answers questions about the complete set of legal king-pawn-king positions in which Black is to move. When processed by machine or interpreted by hand it will deliver for any such position the information whether the lone king is lost or can draw. After allowing for symmetry, there are 97,992 legal KPK positions with Black to move. Of these, 61,787 are lost and 36,205 are drawn. Viewing the decision-tree as an information source, we apply standard theory to credit it with 91,887 bits of information with respect to the LOST versus DRAWN classification. The tree-interpreter need be no more than the code for interpreting ordinary conditional expressions. Also needed are mechanisms for evaluating the six attributes corresponding to nodes. These have been brain-washed by computer languages which build this distinction into their design. Other languages such as LISP and POP-2 treat it, and in Figure 2, as a lookahead algorithm has already been dressed up as a data-structure.

Is for transforming one informationally equivalent structure into another? Figure 1, it too is an information structure. Some will object that algorithmic forms constitute a race apart, not to be lumped with trees, nets, strings, and other structures found in the lowly world of data. These people have been brain-washed by computer languages which build this distinction into their design. Other languages such as LISP and POP-2 treat it, and in Figure 2, as a lookahead algorithm has already been dressed up as a data-structure.

### Equivalent

Another information structure is the complete machine tabulation programmed by Michael Clarke for king-pawn-king, from which the same answers to the same questions are retrievable by lookup. With respect to the possibility of Black's drawing this lookup table contains exactly the same amount of information as each of the others.

Do mechanisable procedures ex-

ist for transforming one informationally equivalent structure into another? Figure 1 with its supporting semi-automatically by Niblett and Shapiro<sup>2</sup> using the Hunt-Quillian induction procedure ID3. Their program iteratively sampled Clarke's database and selected from it tutorially powerful examples for self-administration. The result, as can partially be verified from Figure 1, makes excellent sense to the chess expert. Hence it would be legitimate to speak of its contained information as constituting "knowledge", since it possesses the human-friendly aspect that we recognise by that term<sup>3</sup>, although ID3 has not created information, but simply recast what was already in the lookup table, new knowledge has undoubtedly been minted from Clarke's previously excavated nugget of raw information.

In a second run the experimenters withheld human guidance, so that ID3 was obliged to construct a complete single-level tree from its own resources. As a source of full and accurate information the resulting decision tree was at least equally machine-efficient. But to the chess expert it was gobbledygook and might as well have been made on Mars.

In laboratory experiments at least, the machine learning problem is on the run. In consequence the following question acquires urgency. Much as it might delight certain well-meaning physicists, should we be happy to see the robotics scene flooded with information structures of Martian coinage? Or is there a necessary place for artificial intelligence specialists, who engineer such structures to lie within the "human window"?

Professor Donald Michie is head of the Machine Intelligence Research Unit at Edinburgh University.

References

1. Clarke, M.R.B. (1977) A quantitative study of king and pawn against king. In *Advances in Computer Chess 1* (ed. M.R.B. Clarke), Edinburgh University Press. Only LOST-DRAWN information from the table is relevant here.

2. Niblett, T. and Shapiro, A. (1981) Automatic induction of classification rules for a chess end-game. Paper to be delivered to 3rd International Conference on Advances in Computer Chess, London, 9-10

3. Lighthill, (1973) Artificial Intelligence: a general survey in Artificial Intelligence: a Paper Symposium. London: Science Research Council.

Machine acquisition of classification strategies is critically relevant to robot vision, robot action planning, assembly sequencing and industrial scheduling. New and sharper variations arise of old issues. When, for example, does a given requirement call for the numerical and combinational approaches of classical control engineering and operations research? When should methods be tuned to the user's need for transparency?

To some the path from

is the secret's in the thimble. It

has 128 characters. Instead of the

more usual 96. You get 36% more,

flexibility in handling paperwork than with

most of the daisy-wheel and golf-ball print

elements of other printers. In English, French,

German, Scandinavian, name it. And one

thimble will last more than 30 million clear

impressions. Quietly, quickly.

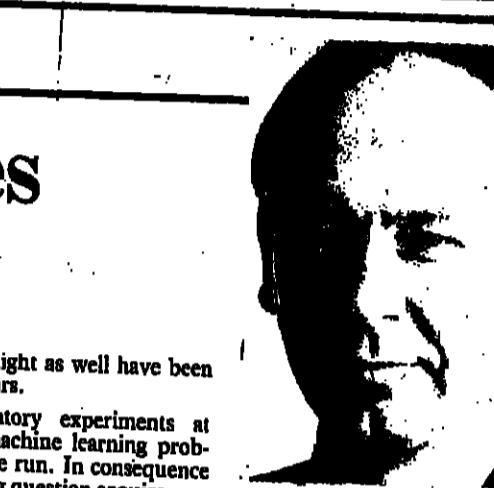
And that's just for openers.

Thanks to our own LSI and microprocessor

technology, the NEC Sphwriter Series 5500,

which comes in three models, gives you

camera-ready print quality. You can plot,



Professor Donald Michie is head of the Machine Intelligence Research Unit at Edinburgh University.

laboratory analysis of chess to advanced robotics seems obscure. To me it has always seemed short and straight.

### Transparent

Another information structure is the complete machine tabulation programmed by Michael Clarke for king-pawn-king, from which the same answers to the same questions are retrievable by lookup.

In a second run the experimenters withheld human guidance, so that ID3 was obliged to construct a complete single-level tree from its own resources. As a source of full and accurate information the resulting decision tree was at least equally machine-efficient. But to the chess expert it was gobbledygook and might as well have been made on Mars.

In laboratory experiments at least, the machine learning problem is on the run. In consequence the following question acquires urgency. Much as it might delight certain well-meaning physicists, should we be happy to see the robotics scene flooded with information structures of Martian coinage? Or is there a necessary place for artificial intelligence specialists, who engineer such structures to lie within the "human window"?

Professor Donald Michie is head of the Machine Intelligence Research Unit at Edinburgh University.

References

1. Clarke, M.R.B. (1977) A quantitative study of king and pawn against king. In *Advances in Computer Chess 1* (ed. M.R.B. Clarke), Edinburgh University Press. Only LOST-DRAWN information from the table is relevant here.

2. Niblett, T. and Shapiro, A. (1981) Automatic induction of classification rules for a chess end-game. Paper to be delivered to 3rd International Conference on Advances in Computer Chess, London, 9-10

3. Lighthill, (1973) Artificial Intelligence: a general survey in Artificial Intelligence: a Paper Symposium. London: Science Research Council.

Machine acquisition of classification strategies is critically relevant to robot vision, robot action planning, assembly sequencing and industrial scheduling. New and sharper variations arise of old issues. When, for example, does a given requirement call for the numerical and combinational approaches of classical control engineering and operations research? When should methods be tuned to the user's need for transparency?

To some the path from

is the secret's in the thimble. It

has 128 characters. Instead of the

more usual 96. You get 36% more,

flexibility in handling paperwork than with

most of the daisy-wheel and golf-ball print

elements of other printers. In English, French,

German, Scandinavian, name it. And one

thimble will last more than 30 million clear

impressions. Quietly, quickly.

And that's just for openers.

Thanks to our own LSI and microprocessor

technology, the NEC Sphwriter Series 5500,

which comes in three models, gives you

camera-ready print quality. You can plot,

on its own profitability. It sees \$50

million being needed to develop a

marketable family of machines to

match the IBM H-series. Power

ratings will start at seven million

instructions per second.

The development team at STC

Computer Research Corp. It is,

based at Sunnyvale, California,

and already has picked up several

key personnel from nearby Am-

erica.

Storage hopes to stand by its

plan to finance the development

company largely from outside

sources on a partnership basis in

order to avoid any adverse effect

on its own profitability.

On its own profitability. It sees \$50

million being needed to develop a

marketable family of machines to

match the IBM H-series. Power

ratings will start at seven million

instructions per second.

The development team at STC

Computer Research Corp. It is,

based at Sunnyvale, California,

and already has picked up several

key personnel from nearby Am-

erica.

Storage hopes to stand by its

plan to finance the development

company largely from outside

sources on a partnership basis in

order to avoid any adverse effect

on its own profitability.

On its own profitability. It sees \$50

million being needed to develop a

marketable family of machines to

match the IBM H-series. Power

ratings will start at seven million

instructions per second.

The development team at STC

Computer Research Corp. It is,

based at Sunnyvale, California,

and already has picked up several

key personnel from nearby Am-

erica.

Storage hopes to stand by its

plan to finance the development

company largely from outside

sources on a partnership basis in

order to avoid any adverse effect

on its own profitability.

On its own profitability. It sees \$50

million being needed to develop a

marketable family of machines to

match the IBM H-series. Power

ratings will start at seven million

instructions per second.

The development team at STC

Computer Research Corp. It is,

based at Sunnyvale, California,

and already has picked up several

key personnel from nearby Am-

erica.

Storage hopes to stand by its

plan to finance the development

company largely from outside

sources on a partnership basis in

order to avoid any adverse effect

## Help for travel agents

COACH operator National Express is using Prestel experimentally to provide details of fares and timetables on 28 of its busiest routes in and out of London and Birmingham.

During the one-year experiment, which started last week, National's marketing department plans to monitor the use made of the system by travel agents and see if ticket-issuing is speeded up by it.

The details occupy 80 Prestel pages within the database maintained by London-based umbrella information provider AVS Intext. A total of 1,352 travel agents currently have Prestel terminals.

National wants to use computer-based information systems to publish details of services to all the 3,000 destinations it covers.

## BBC spec revised

HAVING shortlisted three microcomputers for use with its forthcoming television series First Bye, the BBC has revised the specification.

Additional requirements were decided after running a pilot programme and include the ability to download software from Ceefax.

The choice had been narrowed down previously to Sinclair ZX80, Newbear Computing NewBrain or Nascom and the target price remains under £200.

# TV adapters could bring down cost of Prestel

THE block on the growth of Prestel caused by the high cost of user terminals could be lifted with the appearance on the market of several television adapters selling for around £200.

Tangerine Computer Systems, of Ely, Cambridgeshire, has installed one of its Tantel adapters in each of the 10 Prestel regional centres for demonstrations, and aims to start delivering to mail-order customers by the end of the month.

Meanwhile it wants to line up 400 dealers and is wooing a couple of dozen including television rental companies such as Granada, Rediffusion and Visionair.

Anesfone's new subsidiary Viewdata Business Systems has ordered 100, Tangerine's marketing manager Peter Harding told Computer Weekly, and interest has been shown by potential dealers in Germany, Switzerland, Holland, Belgium and Italy. An order for 3,000 may come from Brazil.

### Later versions

Production plans are for 1,000 this month, 3,000 next month and 6,000 in March. Parts have been ordered for 50,000 units. A £200 printer is planned for about two months hence, probably an imported model, and printer and cassette recorder interfaces are building the current year.

The Tantel has a 16-key keypad built in, with measurements of 9in x 6in x 2½in, is claimed to be half the size of competitors' devices. Later versions are planned to have alphanumeric keyboards and interface for connection to a microcomputer.

Tangerine designs and makes its own microcomputers, but because of the volumes envisaged for Tantel, production has been subcontracted to Brooks of Poole in Dorset, which makes radios for Boots and marine communications equipment.

The Tantel is based on Mullard's Lucy chip, which provides the telephone line and peripheral interfaces and works in conjunction with the Mullard teletext chip which is already in use in 120,000 teletext decoders in the UK.

Harding said that the biggest battle his company had been fighting was for credibility, because other manufacturers had announced similar plans for volume production, but had not carried them out. Tangerine recommends a retail price of £170 plus VAT, based on a price to dealers of £125.

A second manufacturer, Radofin, is also basing its viewdata adapter, the VDX 1000, on the Lucy chip. Aliming to start delivering from the end of next month, it recommends a retail price of £199.95 including VAT and hopes to sell 40,000 units during the current year.

Two additional versions are planned for later this year, called the Teledesk 4000 and 9000, to sell at £450 and £600. The first is designed to provide a continuously changing display from built-in cassette recorder and the second includes a 14-inch colour monitor with a memory function sold for 120 Francs. Today you pay a top price of 15 Francs.

PRIVATE viewdata systems were well chosen to symbolise the price war and the drop in sales which threaten France's fledgling electronics components industry.

Paul Mirat, chairman of EFCIS, the components subsidiary jointly owned by the French Atomic Energy Authority (CEA) and Thomson-CSF, pinpoints the second facet of the threat when he says: "Only eight months ago a sophisticated integrated circuit with a memory function sold for 1,250 by 1985."

These are discouraging auguries for the French government's target of a components industry flying the tricolor flag and able to meet the needs of a national French market worth 2.3 billion Francs in 1985.

"We are right in the middle of the depression and the price war. When will we move out of this situation? I don't really know. Perhaps in six months, eight months or longer", Motorola predicts that, after the current slowdown, the market will pick up in the middle of the current year.

But Motorola is reducing working hours at its Toulouse plant, and Saint Gobain is laying off personnel at Rennes, in Brittany, one of France's highest unemployment areas.

Matra is now putting the finishing touches to an agreement with Intel and Mostek which will complement the association with Harris.

EFCIS, the Thomson-CEA partnership, says its plan is to innovate and create in every field of components. Chairman Paul Mirat comments: "By defining imaginative products and finding original uses for them, we are bound to win in the end. There is no point in wasting our finances on costly basic technology".

Mirat adds: "Let's make the most of our grey matter. That is what Intel succeeded so well. We hope to exceed a turnover of 500 million Francs with a work force of 1,250 by 1985."

These are encouraging auguries for the French government's target of a components industry flying the tricolor flag and able to meet the needs of a national French market worth 2.3 billion Francs in 1985.

Eurotechnique will have to move ahead fast to achieve a turnover of 400 million Francs and make a profit out of its 200 million Francs investment by this date.

Matra Harris' stake and objective are of the same order.

In launching the first Franco-American MOS integrated circuits for France's national component plan, Matra is trying to minimise risks by putting several major risks.

France's Minister of Industry Andre Giraud says: "The industrial revolution will be achieved through electronics." He looks forward to the day when the French will emancipate themselves from American tutelage in electronics in the same way as they are doing in nuclear power generation.

The French Post Office has

promised to buy one and a half billion Francs' worth of semiconductors from this quintet between now and 1985.

Minor manufacturers are complaining about being excluded and are alleging protectionist behaviour. But the Post Office says it is unknown quantity, after a year during which orders doubled. Overall sales of components are expected to rise by between 15 and 20% until the summer, compared with an increase of 30% during 1980.

The campaign for the election at the beginning of May of France's next President of the Republic is a key cause of uncertainty about the prospects for the French economy.

The government is at present pumping in funds to maintain consumption levels.

After an encouraging year in 1980, the French components industry is beginning the new year under the shadow of concern for orders which show signs of flattening out during the coming months.

The prospects for MOS are an

unknown quantity, after a year

during which orders doubled. Overall sales of components are

expected to rise by between 15 and

20% until the summer, compared

with an increase of 30% during

1980.

The regional computer centres

getting Rapport are Bath, London, Manchester, Aberdeen, Aston, Birmingham, East Anglia, Hull, Kent, Leeds, Liverpool, Loughborough, Queen Mary College (London), Sheffield, Southampton, Stirling, University College London, Warwick and York. The hardware will include Prime, CDC, Burroughs, ICL, Digital Equipment, Honeywell and Amico.

Rapport is the first commercially released database system to gain a firm hold on the market.

Logica has already implemented it on a wide range of machines, including Data General, ICL, Unisys, Burroughs, Digital Equipment, IBM, Prime, GEC, Harris and Honeywell, and claims that its portability makes it easy to extend to new machines.

France's Minister of Industry Andre Giraud says: "The industrial revolution will be achieved through electronics." He looks forward to the day when the French will emancipate themselves from American tutelage in electronics in the same way as they are doing in nuclear power generation.

The French Post Office has

promised to buy one and a half billion Francs' worth of semiconductors from this quintet between now and 1985.

Minor manufacturers are

complaining about being excluded

and are alleging protectionist behaviour. But the Post Office says it is

an unknown quantity, after a year

during which orders doubled. Overall sales of components are

expected to rise by between 15 and

20% until the summer, compared

with an increase of 30% during

1980.

The campaign for the election at

the beginning of May of France's

next President of the Republic is

a key cause of uncertainty about the

prospects for the French economy.

The government is at present

pumping in funds to maintain consumption levels.

After an encouraging year in 1980, the French components industry is beginning the new year under the shadow of concern for orders which show signs of flattening out during the coming months.

The prospects for MOS are an

unknown quantity, after a year

during which orders doubled. Overall sales of components are

expected to rise by between 15 and

20% until the summer, compared

with an increase of 30% during

1980.

The regional computer centres

getting Rapport are Bath, London, Manchester, Aberdeen, Aston, Birmingham, East Anglia, Hull, Kent, Leeds, Liverpool, Loughborough, Queen Mary College (London), Sheffield, Southampton, Stirling, University College London, Warwick and York. The hardware will include Prime, CDC, Burroughs, ICL, Digital Equipment, Honeywell and Amico.

Rapport is the first commercially released database system to gain a firm hold on the market.

Logica has already implemented it on a wide range of machines, including Data General, ICL, Unisys, Burroughs, Digital Equipment, IBM, Prime, GEC, Harris and Honeywell, and claims that its portability makes it easy to extend to new machines.

France's Minister of Industry Andre Giraud says: "The industrial revolution will be achieved through electronics." He looks forward to the day when the French will emancipate themselves from American tutelage in electronics in the same way as they are doing in nuclear power generation.

The French Post Office has

promised to buy one and a half billion Francs' worth of semiconductors from this quintet between now and 1985.

Minor manufacturers are

complaining about being excluded

and are alleging protectionist behaviour. But the Post Office says it is

an unknown quantity, after a year

during which orders doubled. Overall sales of components are

expected to rise by between 15 and

20% until the summer, compared

with an increase of 30% during

1980.

The campaign for the election at

the beginning of May of France's

next President of the Republic is

a key cause of uncertainty about the

prospects for the French economy.

The government is at present

pumping in funds to maintain consumption levels.

After an encouraging year in 1980, the French components industry is beginning the new year under the shadow of concern for orders which show signs of flattening out during the coming months.

The prospects for MOS are an

unknown quantity, after a year

during which orders doubled. Overall sales of components are

expected to rise by between 15 and

20% until the summer, compared

with an increase of 30% during

1980.

The campaign for the election at

the beginning of May of France's

next President of the Republic is

a key cause of uncertainty about the

prospects for the French economy.

The government is at present

pumping in funds to maintain consumption levels.

After an encouraging year in 1980, the French components industry is beginning the new year under the shadow of concern for orders which show signs of flattening out during the coming months.

The prospects for MOS are an

unknown quantity, after a year

during which orders doubled. Overall sales of components are

expected to rise by between 15 and

20% until the summer, compared

with an increase of 30% during

1980.

The campaign for the election at

the beginning of May of France's

next President of the Republic is

a key cause of uncertainty about the

prospects for the French economy.

The government is at present

pumping in funds to maintain consumption levels.

After an encouraging year in 1980, the French components industry is beginning the new year under the shadow of concern for orders which show signs of flattening out during the coming months.

The prospects for MOS are an

unknown quantity, after a year

during which orders doubled. Overall sales of components are

expected to rise by between 15 and

20% until the summer, compared

with an increase of 30% during

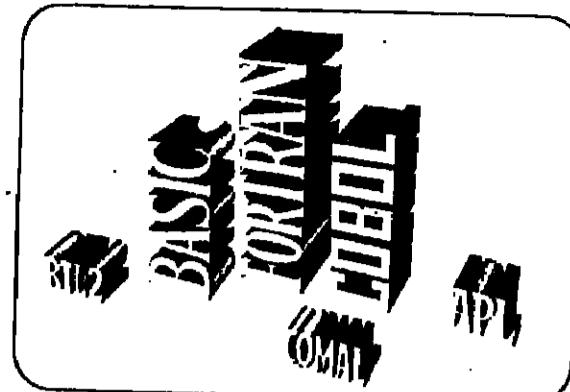
1980.

The campaign for the election at

the beginning of May of



## SOFTWARE FILE



## MINORITY LANGUAGES

"Something is rotten in the state of Denmark." — Marcellus.  
"O, reform it altogether." — Hamlet.

In the early 1970s Borge Christensen of the State Teachers' College, Tønder, Denmark, had made a start in computer education. He had an RC minicomputer and used Basic to introduce programming to his students.

Like many other teachers he appreciated its short vocabulary, simple syntax and easy operating environment. But all was not well, and he illustrates the bad side of Basic with the story of "John's Problem".

John had come back to one of his own programs after a few months in order to use it again. The program had a bug which John asked his tutor to find. After some patient re-analysis the bug was found along with two program statements which were entirely redundant. The flow of control in the program was such that in no circumstances could they ever be executed.

The trouble was caused mainly by injudicious use of GOTO statements, and the lack of clarity was made worse by the lack of meaningful variable names.

Subsequent investigation and discussion led Christensen to the conclusion that Basic lacked some essential structures. The deficiencies made the use of GOTOS necessary, and the easy operating environment did not encourage the rigour and discipline which might have mitigated its effects.

Feeling that Basic had too many

A NEW generation of languages has grown up to serve the various fields in which computers have found a role. Software File is sampling a few of these "minority languages" and handing over to specialists to explain how they can

be of particular value to both programmer and end user.

This week Roy Atherton, of Bishops College of Higher Education, discusses the language Comal, which he sees as "a cure for Basic". He believes that it will soon

be widely used in education, and that it may well win acceptance for business applications, although it started as a micro language geared towards teaching students the philosophy and practice of programming.

other machines, and in March of that year a definitive Comal standard was published by a committee based in Denmark but with international connections.

Towards the end of 1980 several systems had Comal: the original RC mini, ICL 2900, Data General Nova, Comet and Piccolo microcomputers. Commodore and Research Machines had also ex-

plained strong interest. By this time it had replaced Basic in the Danish "Folksskolen" (7-16 years), in the "Gymnasium" (16-19 years) and in the teachers' colleges.

This was a remarkably fast rate of dissemination for new software, and one has to ask why and how it happened.

Firstly, Comal draws strength from two great traditions: the practicality of the Fortran/Basic line and the educational (and practical) appropriateness of the Algol/Pascal development. Secondly, the strong grip of Basic was acknowledged and there was no confrontation, simply extension and infiltration. Comal is defined as a set of extensions to be attached to a host Basic.

Thirdly, teachers were offered the new software free and invited to try the extra features in their own time. Basic is a subset of Comal and the new features can be

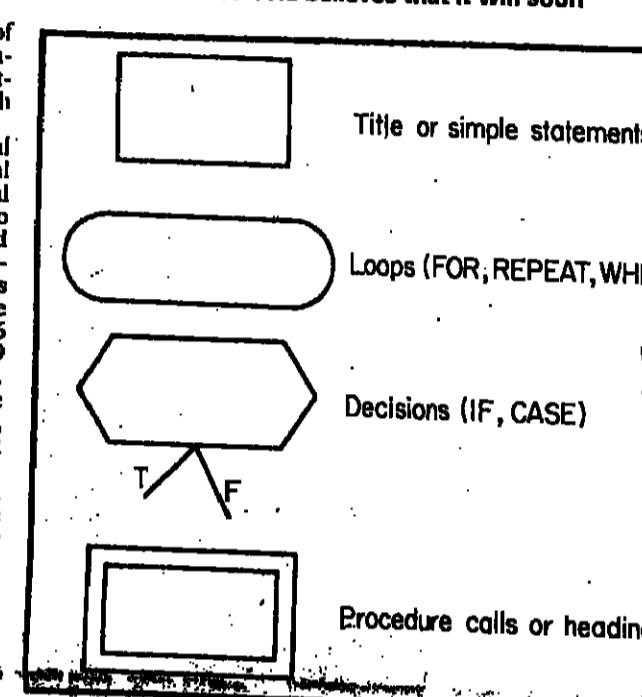


Figure 4.

beneficial influence on the way people think about problems. Essentially there are only six structural elements: FOR/NEXT, REPEAT/UNTIL, WHILE/ENDWHILE, IF/THEN/ELSE, CASES and procedures (Comal notation).

These six simple structures can be related in only three ways: they can follow one after another, they can be nested, or procedures can be defined and called.

But unlike Basic, Comal also allows exit from a loop in two ways on a condition.

REPEAT  
(choose a direction)  
(move to next square)  
UNTIL (he is off the grid)

WHILE (he is on the grid)  
(choose a direction)  
(move to next square)  
ENDWHILE

2. Decisions. It so happens that the character counting example lends itself easily to binary types of decision-making. This can be represented visually by the structure diagram shown in Figure 1.

This diagram, and the indenting of code forced by a correct Comal implementation, help to preserve understanding in a situation (nested IF statements) regarded by many as one of the least comprehensible types of program segment (see Figure 2).

The other type of decision is the multiple branch or CASE structure. Drunken Duncan illustrates this, as seen in Figure 3.

In both binary and multiple decisions control is maintained, the choices are clear and control continues at the bottom of the element.

3. Procedures. In Comal pro-

cedures are used and correct indenting is observed but for simplicity and to highlight the structures, the items within the structures are sometimes stated loosely in ordinary English enclosed in brackets. All elements will be illustrated by parts of two programs.

The "Drunken Duncan" simulation in which a man staggers around a grid moving randomly North, South, East or West.

A program which counts the frequency of vowels, consonants, digits and other characters, including spaces, in a piece of text.

1. Loops. Comal, like Basic

IF (letter) THEN

IF (west) THEN

  Increase vowel count

ELSE

  Increase consonant count

ENDIF

ENDIF

IF (not space) THEN

  IF (digit) THEN

    Increase digit count

  ELSE

    Increase other count

  ENDIF

&lt;p

## OP SPOT

## When £80 a week is a small fortune

OPERATORS earning £4,031 a year can consider themselves as doing fairly well, according to a recent survey released in mid-January. National Analysis of Salaries and Wages is published by Reward Regional Surveys of Stone, Staffs.

The £4,031 is a median figure arrived at as a result of inquiries to 132 companies. The people who conducted the survey, which is based on all jobs in 293 private sector companies, stress the difference between a median and an average figure.

By ranking salaries from the highest to the lowest, the median salary is the one which stands at

	senior operator	operator
Upper decile	£6,784	£5,600
Upper quartile	£6,650	£4,740
Median	£5,350	£4,031
Lower quartile	£4,846	£3,688
Lower decile	£4,036	£3,170

Table 1: How does your salary match up to what is on this chart? Reproduced by courtesy of Reward Regional Surveys Ltd.

18.23% increase on the 1979 annual salary of £3,477.

A senior operator, according to CUYB, could have compared his pay cheques with a median figure of £5,331 in 1980.

In the six months since spring 1980, the Reward Regional survey found operators' salaries to have increased by 10% while senior operators fared slightly better with a 13% median increase. That amounts to £398 and £650 respectively.

Similarly, it means more to quote the quartiles and deciles of Table 1. Aficionados of jargon will be pleased to learn that 50% of the entries fall between the upper and lower quartile and the range between upper and lower deciles is 99%.

The Computer Users' Year Book for 1980 has operations as a slightly more remunerative job. Its 1980 median salary figure for ops is £4,111 which is, incidentally, an average figure.

By ranking salaries from the highest to the lowest, the median salary is the one which stands at

## 11/23 UPGRADE

KDFII PROCESSOR

256KB MEMORY

PRICE £2,150

## 11/23 CHASSIS

KDFII PROCESSOR  
256KB MEMORY  
DLVII-J INTERFACE  
CHASSIS 8 x 4

PRICE £3,200

## 11/23 SYSTEM

KDFII PROCESSOR  
64KB MEMORY  
DLVII-J INTERFACE  
CHASSIS 8 x 4  
32 MBYTE HARD DISK  
CABINET

PRICE £7,860

## LOW COST 11/23

FROM

ARROW

ROSEMOUNT TOWER, STAFFORD ROAD, WALLINGTON, SURREY SM8 8RW.

ARROW COMPUTER SYSTEMS LTD

Telephone: 01-847 0882

## CB - the countdown has begun!

Get ready for Citizens Banding and with a brand-new magazine that tells you everything you want to know. We've got full colour spreads on customised American trucks. We offer special deals on CB World shirts. Should we use US truck speak or Tshirts, caps and badges? And we ask: create our own English lingo? And what about the radio amateur - and the aircraft modeller? Tell us what you feel. Get involved - and get this very first issue of CB World! Published by PC - the new world of radio and electronic messaging.



FIRST ISSUE  
OUT NOW 60P

by Paul Fish

## How to make op safe against the industrial wrong

SOME computer operators have the opportunity to be dishonest on a large scale. But most cases of operator crime never come to light because it is not in a company's interest to publicise how it has been done.

Mailing lists, payroll and profit details and budget plans can all be of value. The op, who is often not earning a great deal, has easy access to the goods and is a prime target for temptation. That's the opinion of Malcolm Fry.

Fry says of his 15-year career in operations: "There isn't a job I haven't done." Now he is planning to publish a book on operations espionage.

He recommends that should be destroyed. Drivers should be the ability of the ops manager also have the opportunity.

Perhaps the most important is that the mortgage should be removed from the temptation.

Fry reckons that security should be tightened with an alarm connected to the guard's office once the computer room is left vacant for

the night. Ops should pass and should be kept secret.

"Every time an op is noticed, it's escort is still in the company, he or she is allowed to take a big putter room."

"So, pay rises are slowing down but not, as yet, dramatically." For 1981, increases of between 12% and 14% are predicted.

Taking the median predicted increase figure of 13% - and placing a degree of trust in the findings of the survey - an operator would be justified in demanding an autumn 1981 pay rise of £554.

## COMPANY NEWS

## CAP Gemini Sogeti takes over Norwegian consultancy

THE giant French-based computer services group, CAP Gemini Sogeti, has extended its empire with the acquisition of the Norwegian software consultancy Data Logic. The latter firm was owned by Data Logic of the UK until 1972 when it was bought by its Norwegian employees.

According to CGS, Data Logic is the largest Norwegian company in the field of

professional computing services, excluding service bureaux. It employs 56 professional staff and chalked up a turnover of well over \$2 million in 1980, although this is trivial compared with the turnover of its new parent company.

Data Logic's existing customers include banks, shipping companies, the Norwegian government and the computer industry, including Norway's biggest domestically owned computer firm, Norsk Data.

The CGS empire in Northern Europe al-

ready includes companies in Sweden, West Germany, the Netherlands, Belgium and Switzerland. In the UK CGS jointly owns IAL Gemini with International Aeradio.

Last autumn CISI, the computer services subsidiary of the French Atomic Energy Commission, sold its 34% share in CGS to a group of French financial organisations. CGS now has 3,000 staff.

## ICL shares still on the slide

ICL shares continued their downward slide and sank a further 10p to 48p last week. Stockbrokers Heslethin Moss predicted the shares would hold temporarily around 50p, and then fall to 30p.

Reports from the company suggest some improvement in overseas orders but this will probably still be at a high price in terms of profitability.

The breakdown of the talks in Geneva on Namibian independence has brought nearer an international trade embargo on South Africa, and simultaneously a threat to ICL's best market in Africa.

## Investment trust nets £97,000

EDINBURGH-based Independent Investment trust, on the unlisted securities market at a current price of 117p, the following companies appear among its holdings: Apple Computer (150,000); Centronics (25,000); Data I/O (34,884); Lanier Business Products (85,000) and Sensorsonic (80,000). The company holds 875,000 shares in United Scientific Holdings and 90,000 shares in Wilmart R&D, both UK companies.

## Growing pains hit Scicon profits

STRONG growth in turnover is reported by each of the two domestic Scicon companies for last year, but heavy outlays on staff and new equipment have depressed apparent profitability.

Scicon Consultancy International saw turnover increase from £112 million in 1979 to over £14 million with, at best, no increase in profits on the £200,000 made last year.

Scicon Computer Services reported turnover up from £4.4 million in 1979 to £5.3 million in 1980, with profits dropping from £200,000 to £100,000 respectively.

The consultancy company, like Scicon Computer Services wholly owned by British Petroleum, gains 45% of its revenue from work in the defence field, with contracts in Saudi Arabia and the rest of the Middle East. SCI's complementary work within Nato and for the US Department of Defence, where it has a major sonar programme under way for the US Navy, was one of its attractions to Scicon.

After a peak of £1 million profits on £3.7 million turnover in 1978, Scicon Computer Services has seen profit outturn slip back in a market described by deputy managing director Jack O'Malley as "tough".

Scicon Consultancy has just paid over \$10 million for Systems Control Inc of California, a move which will add 500 employees to the company's existing 700 and bring in turnover for the year ending February 28 of around \$25 million. The final turnover figure will determine SCI's exact price.

The consultancy company, like Scicon Computer Services wholly owned by British Petroleum, gains 45% of its revenue from work in the defence field, with contracts in Saudi Arabia and the rest of the Middle East. SCI's complementary work within Nato and for the US Department of Defence, where it has a major sonar programme under way for the US Navy, was one of its attractions to Scicon.

After a peak of £1 million profits on £3.7 million turnover in 1978, Scicon Computer Services has seen profit outturn slip back in a market described by deputy managing director Jack O'Malley as "tough".

Scicon Consultancy has just paid over \$10 million for Systems Control Inc of California, a move which will add 500 employees to the company's existing 700 and bring in turnover for the year ending February 28 of around \$25 million. The final turnover figure will determine SCI's exact price.

The consultancy company, like Scicon Computer Services wholly owned by British Petroleum, gains 45% of its revenue from work in the defence field, with contracts in Saudi Arabia and the rest of the Middle East. SCI's complementary work within Nato and for the US Department of Defence, where it has a major sonar programme under way for the US Navy, was one of its attractions to Scicon.

After a peak of £1 million profits on £3.7 million turnover in 1978, Scicon Computer Services has seen profit outturn slip back in a market described by deputy managing director Jack O'Malley as "tough".

Scicon Consultancy has just paid over \$10 million for Systems Control Inc of California, a move which will add 500 employees to the company's existing 700 and bring in turnover for the year ending February 28 of around \$25 million. The final turnover figure will determine SCI's exact price.

The consultancy company, like Scicon Computer Services wholly owned by British Petroleum, gains 45% of its revenue from work in the defence field, with contracts in Saudi Arabia and the rest of the Middle East. SCI's complementary work within Nato and for the US Department of Defence, where it has a major sonar programme under way for the US Navy, was one of its attractions to Scicon.

After a peak of £1 million profits on £3.7 million turnover in 1978, Scicon Computer Services has seen profit outturn slip back in a market described by deputy managing director Jack O'Malley as "tough".

Scicon Consultancy has just paid over \$10 million for Systems Control Inc of California, a move which will add 500 employees to the company's existing 700 and bring in turnover for the year ending February 28 of around \$25 million. The final turnover figure will determine SCI's exact price.

The consultancy company, like Scicon Computer Services wholly owned by British Petroleum, gains 45% of its revenue from work in the defence field, with contracts in Saudi Arabia and the rest of the Middle East. SCI's complementary work within Nato and for the US Department of Defence, where it has a major sonar programme under way for the US Navy, was one of its attractions to Scicon.

After a peak of £1 million profits on £3.7 million turnover in 1978, Scicon Computer Services has seen profit outturn slip back in a market described by deputy managing director Jack O'Malley as "tough".

Scicon Consultancy has just paid over \$10 million for Systems Control Inc of California, a move which will add 500 employees to the company's existing 700 and bring in turnover for the year ending February 28 of around \$25 million. The final turnover figure will determine SCI's exact price.

The consultancy company, like Scicon Computer Services wholly owned by British Petroleum, gains 45% of its revenue from work in the defence field, with contracts in Saudi Arabia and the rest of the Middle East. SCI's complementary work within Nato and for the US Department of Defence, where it has a major sonar programme under way for the US Navy, was one of its attractions to Scicon.

After a peak of £1 million profits on £3.7 million turnover in 1978, Scicon Computer Services has seen profit outturn slip back in a market described by deputy managing director Jack O'Malley as "tough".

Scicon Consultancy has just paid over \$10 million for Systems Control Inc of California, a move which will add 500 employees to the company's existing 700 and bring in turnover for the year ending February 28 of around \$25 million. The final turnover figure will determine SCI's exact price.

The consultancy company, like Scicon Computer Services wholly owned by British Petroleum, gains 45% of its revenue from work in the defence field, with contracts in Saudi Arabia and the rest of the Middle East. SCI's complementary work within Nato and for the US Department of Defence, where it has a major sonar programme under way for the US Navy, was one of its attractions to Scicon.

After a peak of £1 million profits on £3.7 million turnover in 1978, Scicon Computer Services has seen profit outturn slip back in a market described by deputy managing director Jack O'Malley as "tough".

Scicon Consultancy has just paid over \$10 million for Systems Control Inc of California, a move which will add 500 employees to the company's existing 700 and bring in turnover for the year ending February 28 of around \$25 million. The final turnover figure will determine SCI's exact price.

The consultancy company, like Scicon Computer Services wholly owned by British Petroleum, gains 45% of its revenue from work in the defence field, with contracts in Saudi Arabia and the rest of the Middle East. SCI's complementary work within Nato and for the US Department of Defence, where it has a major sonar programme under way for the US Navy, was one of its attractions to Scicon.

After a peak of £1 million profits on £3.7 million turnover in 1978, Scicon Computer Services has seen profit outturn slip back in a market described by deputy managing director Jack O'Malley as "tough".

Scicon Consultancy has just paid over \$10 million for Systems Control Inc of California, a move which will add 500 employees to the company's existing 700 and bring in turnover for the year ending February 28 of around \$25 million. The final turnover figure will determine SCI's exact price.

The consultancy company, like Scicon Computer Services wholly owned by British Petroleum, gains 45% of its revenue from work in the defence field, with contracts in Saudi Arabia and the rest of the Middle East. SCI's complementary work within Nato and for the US Department of Defence, where it has a major sonar programme under way for the US Navy, was one of its attractions to Scicon.

After a peak of £1 million profits on £3.7 million turnover in 1978, Scicon Computer Services has seen profit outturn slip back in a market described by deputy managing director Jack O'Malley as "tough".

Scicon Consultancy has just paid over \$10 million for Systems Control Inc of California, a move which will add 500 employees to the company's existing 700 and bring in turnover for the year ending February 28 of around \$25 million. The final turnover figure will determine SCI's exact price.

The consultancy company, like Scicon Computer Services wholly owned by British Petroleum, gains 45% of its revenue from work in the defence field, with contracts in Saudi Arabia and the rest of the Middle East. SCI's complementary work within Nato and for the US Department of Defence, where it has a major sonar programme under way for the US Navy, was one of its attractions to Scicon.

After a peak of £1 million profits on £3.7 million turnover in 1978, Scicon Computer Services has seen profit outturn slip back in a market described by deputy managing director Jack O'Malley as "tough".

Scicon Consultancy has just paid over \$10 million for Systems Control Inc of California, a move which will add 500 employees to the company's existing 700 and bring in turnover for the year ending February 28 of around \$25 million. The final turnover figure will determine SCI's exact price.

The consultancy company, like Scicon Computer Services wholly owned by British Petroleum, gains 45% of its revenue from work in the defence field, with contracts in Saudi Arabia and the rest of the Middle East. SCI's complementary work within Nato and for the US Department of Defence, where it has a major sonar programme under way for the US Navy, was one of its attractions to Scicon.

After a peak of £1 million profits on £3.7 million turnover in 1978, Scicon Computer Services has seen profit outturn slip back in a market described by deputy managing director Jack O'Malley as "tough".

Scicon Consultancy has just paid over \$10 million for Systems Control Inc of California, a move which will add 500 employees to the company's existing 700 and bring in turnover for the year ending February 28 of around \$25 million. The final turnover figure will determine SCI's exact price.

The consultancy company, like Scicon Computer Services wholly owned by British Petroleum, gains 45% of its revenue from work in the defence field, with contracts in Saudi Arabia and the rest of the Middle East. SCI's complementary work within Nato and for the US Department of Defence, where it has a major sonar programme under way for the US Navy, was one of its attractions to Scicon.

After a peak of £1 million profits on £3.7 million turnover in 1978, Scicon Computer Services has seen profit outturn slip back in a market described by deputy managing director Jack O'Malley as "tough".

Scicon Consultancy has just paid

## PROGRAMMERS' PAGE



Robin Lansy, seated at Portway School's Cado 20 computer, and Michael Rees (right) are two of the three 17-year-olds who have started a company, Software Six, supplying services to other Cado users. Profits return to the school - and headmaster John Larkins looks on approvingly.

## Sixth form goes into business

IT'S not only policemen that are getting younger - so are entrepreneurs. You don't even need to have left school these days before starting your own business.

Sixth-formers at the Portway School, Bristol, have set up a company, some of the first services now offered to other Cado users by UK distributors DRG Business Machines of Weston-super-Mare and London.

DRG's managing director, Mike Kilmarin, described how he had loaned the school a Cado a year ago. "They have turned out some remarkably good programmers. We have no hesitation in using them for some of our overlaid work."

Software Six cut its teeth on such in-school activities as examination administration, timetabling and pupil records. A mark of confidence is that its next task is to tackle computerising school accounts.

Executives of Software Six are three 17-year-olds: Michael Rees, managing director; his deputy, Robin Lane, and financial director, Gary Nash.

Between them, the three must run the company as a properly-constituted commercial organisation with shareholders and company accounts - no doubt put on the Cado.

One difference, though, is that all profits go back to the school so it won't be a get-rich-quick exercise for the gang of three. But it riches lie in experience.

The whole project is part of the Young Entrepreneurs Scheme and a fatherly eye will be kept on progress by ASC Chemicals of Avonmouth, which sponsors the school under the scheme.

### Puzzler

WHAT is the next number in this sequence, given that the "intervals" between each pair of adjacent figures (1, 1, 2, 2, 7, 69, 21) are not significant?

1811 20 22 24 31 100 121?

See page 43 for solution.

## PEOPLE and EVENTS

### DP manager promoted to director at IBM



Hillier Cave

### New post at Racal-Redac

THE board of directors of IBM Ltd has elected Richard Marston, the managing director of a wholly-owned subsidiary, to be appointed to the Governor of North Europe.

In 1967 his experience in the computer industry began when he joined IBM UK as a data processing salesman. He has since held several management positions both at the company's head office in the Bristol branch office.

Until his new appointment he was DP manager, South Western.

Alan Senior has been appointed managing director of AM Varitype, a subsidiary of the company, from Harris Systems Ltd, where he held the position of general manager for the computer systems division.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Alan Taylor has been appointed sales manager at Sigma Electronics. He was previously a sales engineer with EMI and later joined Sigma as sales executive.

### IAL management changes

SEVERAL senior management changes have been made at IAL. Jack Gentle, appointed products director, has been appointed to the board.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Alan Taylor has been appointed sales manager at Sigma Electronics. He was previously a sales engineer with EMI and later joined Sigma as sales executive.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of the Irish Computer Services Association. Pat Chamberlain, COPS vice-chairman.

George Dufford, commercial director for IAL, has taken on the additional role of managing director of the company's International Hospital Group.

Tony Cunningham, previously finance director of computer supplier, and business development manager of the company's manufacturing and computer services.

Two assistant general managers have been appointed: they are Mike Clark, who will work in the data products group, and George Sellers, in manufacturing.

John Collins has been appointed computer products sales engineer at Ampex. He joins the company from Data Translation.

Tom Winter, managing director of ICS Computing, has been elected chairman of

# FINANCING THE COMPUTER

COMPUTER WEEKLY, January 22, 1981

Financing the computer is a problem which has nurtured a tangled jungle of knowledge as convoluted as the innards of any mainframe. In this special supplement one of our own reporters looks at an entrepreneurial leasing com-

pany, Computer Financing; Parry Mitchell of United Leasing explains the role of his company as does Daphne Kandiah of Hamilton Rentals; and Allen Pawlyn advises on whether to rent, lease or buy.

## Cashing in on a booming market

by a Staff Reporter

KEEPING a watchful eye on a simple ratio could have avoided the horrors of multi-million dollar losses on computer leasing currently being agonised over by the Lloyd's insurance market.

That's the equally simple lesson being drawn by Peter Hunt, chairman and owner of Computer Financing, from the debacle caused by the collapse of IBM 370 values after the launch of the 4300 range in early 1979.

The ratio is the comparison between monthly rental cost and purchase price. IBM typically set its rental charge so that 48 monthly payments equalled outright sale price, says Hunt.

When that ratio on the later (380/148) models had crept up to something like 35:1 by late 1977, there was clearly something going on.

### Field day

IBM was encouraging the purchase of equipment which was to be superseded shortly. But US leasing companies continued to assume the same residual values (proportion of the cost not covered by lease payments) as before and had a short-term field day during which they were able to undercut IBM's rentals and maintained profit margins.

The upshot - which is history as they say - was that Lloyd's of London and other insurers were left holding policies on equipment valued way above actual resale prices.

Hunt, 42, is that well-known animal in the financial world - the entrepreneur. With a background as programmer, then salesman, with NCR his first involvement with leasing came at Standard Chartered Bank on postings to Amsterdam and Dusseldorf.

Hunt says that this shows up another vital aspect of the computer leasing business. Almost uniquely, secondhand values of IBM computers depend not on the physical age of the machine but on the age of the range.

A 3033 bought today will have virtually the same resale value as the same machine bought when the range was first introduced, Hunt notes.

Hunt also avoided leasing 3033

models as he reckoned the fact that they basically contained 370 architecture made 3033s vulnerable to the launch of a radically new IBM series. At the time of their launch, he was gearing up to the 4300 range and had ordered around £4 million of machines as his first foray into leasing.

Similarly, Hunt now sees the H-series 3081 as causing a substantial fall in 3033 secondhand values. A 3033 bought new, for between £600-700,000, for example, can now be had for around £200,000 secondhand.

Ergo, any leasing company working on a residual of more than that, or unable to re-lease and bring in income, getting down to



Seeing the lighter side of life in the leasing market are (left to right): Peter C. Hunt, chairman of Computer Financing International Ltd.; Max Cowper-Smith, resident lawyer at Computer Financing International Ltd.; and Stephen J. Measures, international sales director of Computer Financing International Ltd.

Hunt started the laborious task of working through the Computer Users' Year-book searching for projects, with the object of getting into leasing.

### Controversy

Leasing has been generating much controversy of late. Some of it has been related to the collapse of ITEL and the horrendous claims faced by Lloyd's.

Still more has stemmed from the controversy over flexible leasing, where a 'mature lease' agreement can be terminated by a separate agreement, provided the lease takes another machine from the flexible leasing company.

Hunt stresses that in doing this there is only one lease agreement with its termination clause bedded in the main body.

Hunt says his leasing operation will really take off when it delivers of his 12 model 3081s through - at a total cost of £24 million.

Having kept clear of the 3033s, "IBM are making it attractive to people to buy those, it's been repeating itself" - Hunt notes that he can cash in on what he sees as a booming leasing market.

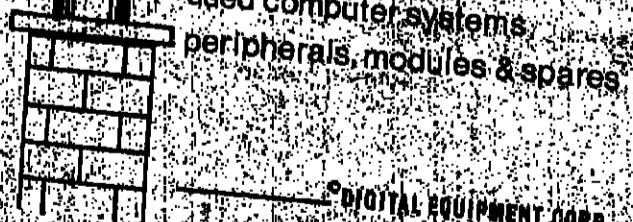
IBM was encouraging the purchase of equipment which was to be superseded shortly. But US leasing companies continued to assume the same residual values (proportion of the cost not covered by lease payments) as before and had a short-term field day during which they were able to undercut IBM's rentals and maintained profit margins.

The upshot - which is history

## SWEEP RECESSION AWAY!

CALL 01-602 4502  
COMPUTER BROKING SERVICES

Leading brokers in DEC®  
Used computer systems,  
peripherals, modules & spares



IBM 3033-U12  
AVAILABLE - NOW (NEW)

IBM 3150-K00  
AVAILABLE NOW

3033-U6  
MARCH '81

3148-K00  
FEB. '81

3031-4  
FEB. '81

4341-4  
FEB. '81

+ 3333 3340 3350 3380 3803  
+ 3330 3343 3370 3830 3420  
FROM CPS LEASING AND BROKERS  
CPS COMPUTER GROUP, BLACKFRIARS HOUSE, WARWICK

## If it's a question of which terminal to choose, we'll give you The TOTAL Answer

It isn't just that we supply high quality terminals from leading manufacturers such as DEC, Hewlett-Packard, Tektronix, Diablo and Texas Instruments - there's much, much more.

For a start we've got branches throughout the UK with full demonstration facilities and technical staff to advise on the most suitable terminal for your applications.

Next, we offer a very flexible rental scheme, with or without a Purchase Option, which includes on-site maintenance. This gives you the opportunity to evaluate equipment prior to purchase and upgrade any time without penalty.

Alternatively, if you decide to take advantage of our competitive sale prices, we'll give you a full 90 days warranty.

Finally, our Service Group provide Maintenance Agreements for all equipment in our range. These cover you for not only routine upkeep of equipment but act as an effective emergency service to minimise computer 'downtime'.

To find out more, contact your nearest branch today. If you've got any questions, one phone call could give you The TOTAL Answer.



The  
TOTAL  
Answer  
HAMILTON

To: Technical Sales Division, Hamilton House,  
North Circular Road, London NW10 7UB.

I am interested in the following terminals:

Name \_\_\_\_\_

Company \_\_\_\_\_

Position \_\_\_\_\_

Address \_\_\_\_\_

Tel No. \_\_\_\_\_

Hamilton Rentals Limited  
Hamilton House  
North Circular Road  
London NW10 7UB

London 01-881 6777  
Birmingham 021-236 3561  
Manchester 061-848 8338/8434  
Central Scotland 0501 43182  
Aberdeen 0224-25301

Paris  
Düsseldorf  
Toronto  
New York

# Dramatic effect of the IBM Consent Decree

IBM computer leasing is based on operating leasing. This is a type of lease funding which is rare and applicable to few products — ships for one — but IBM computers make up the largest single market.

Conventional or finance leasing is where the finance source seeks to recover the capital cost of the item (plus interest and profit) by the end of the lease period. This is often five years but could fall within the two to ten year range.

Operating leasing is rather more complex, because the lessor estimates what the equipment will be worth at the end of the lease period. He then discounts the rentals, assuming that sum, thereby providing the lessor (the user) with cheaper finance.

The lessor will expect to re-market that equipment on a second lease to recover the outstanding portion of capital cost and his profit.

The point of interest is: Why should this be applicable to IBM processors and very little else? The answer emerged first in 1956 when a legal decision was taken in the form of a Consent Decree signed between IBM and the US Justice Department.

Before that, IBM was being taken to task for its monopolistic activities and came to a settlement with the Justice Department at the end of the first lease period.

Leasing companies operate

therefore under the umbrella of the IBM Consent Decree, under which IBM:

a) Must offer all equipment for sale at prices which have an economic link with IBM's own monthly rental.

b) May not discriminate in any way between customers who purchase or rent equipment from it.

c) May not offer different prices to different customers.

d) May not offer better delivery positions to different customers.

e) May not offer different stan-

dards of maintenance, software support, etc., to different customers.

The effect of this Consent Decree, which is now built into IBM's business practices, is dramatic. IBM adheres to its policy in practice as well as in theory.

In circumstances where individuals transgress this policy, there are channels within IBM for companies like United Leasing to

appliance of 360 provided the fertile bed from which computer leasing could grow, with leasing companies assured that the equipment would have a certain life.

IBM was not permitted to under-cut the leasing companies or to depart from their stated prices and the computer leasing company could predict medium-term developments within the market place.

The concept was born of the "ubiquitous" IBM computer, a product that will function equally well in Chicago and Singapore and which will be maintained by the same company in either location at approximately the same price.

On a worldwide basis, the investor in IBM equipment could be certain that there was a large potential market for his equipment at the end of the first lease period.

In selecting to offer operating leasing in the computer area, it is necessary for leasing companies to be certain of a market, not only to conclude the original lease but also, and much more importantly, to be confident about re-marketing the equipment.

Companies make massive investments in their computer programs and software development, and the prospect of having to "scrap" these programs every four or five years because they no longer fit a manufacturer's computer architecture is clearly abhorrent.

The columns in Table A indicate the number by category of machines which are rented, purchased and leased, the right-hand column showing the total value of that market to be \$5.7 billion.



Parry Mitchell is chairman of London-based United Leasing. Here he explains the workings of lease finance and its role as an alternative between renting and outright purchase. His remarks are concentrated on IBM.

his or her flexibility to change equipment when necessary.

Operating leasing stands in the middle; it is neither as constricting as the finance lease, nor as expensive as renting from IBM.

Operating lessors sell their products on the basis that the customer will want to keep his equipment for somewhere between three and five years.

It can be seen quite clearly that there is a vast market potential for operating leasing but IBM's ability to retain the loyalty of its customers is remarkable nevertheless.

Why do companies lease computers from computer leasing specialists? To a computer manager, the most important requirement is to process data for the company and the manager needs total flexibility to swap equipment around in order to meet company requirements.

Renting equipment from IBM is very expensive but purchasing equipment or writing finance leases frequently puts the computer user in a strait-jacket, limiting

delivery date.

If general purchase price increase, you will be protected; if the decrease IBM will not benefit to you.

This is a standard clause in purchase agreement. Under business practice, you have the right to convert a purchase rental agreement at any time.

Operating leasing offers

prompt and relatively cheap delivery.

Larger leasing companies have significant quantities of equipment available from their own portfolio or on order from IBM. Computer leasing companies should be able to offer savings over IBM, better delivery schedules or both.

A piece of cautionary advice. Whenever you order any piece of IBM equipment, insist on signing a purchase rather than a rental contract. The reason is that under IBM's purchase agreement you are given price protection for the six-month period until the scheduled

beyond this is for a nominal charge.

With the operating type of lease, the leasing company anticipates that the equipment will still have a residual value after the expiry of the principal period, and takes this into account when determining the leasing charges to be paid by the user. The user has the right to terminate the rental at fairly short notice (say three months). This makes rental a good choice where the user knows he will want to change the equipment within, for example, two years, or where he is very uncertain of his future requirements.

The essence of renting equipment is that it remains the property of the manufacturer; the user simply pays for the right to use. The user has the right to terminate the rental at fairly short notice (say three months). This makes rental a good choice where the user knows he will want to change the equipment within, for example, two years, or where he is very uncertain of his future requirements.

In determining the likely realisable value of the equipment, the leasing company obviously takes into account the chances of the equipment becoming obsolete. In the last two years this risk has increased owing to the accelerating pace of technological change, and leasing companies have suffered losses by being unable to realise the assumed residual value of equipment on which the lease has expired or been terminated early.

It is anticipated that this type of lease will become less common, or at best more expensive. It has always tended to be applied mainly to the large mainframe system.

The financial lease, however, does not suffer the same disadvantage in the eyes of the leasing company and is available on almost any system, either via the supplier or by making arrangements independently with a leasing company.

The reason financial leases exist derives from the granting of first-year tax allowances to a business which buys capital equipment. As the leasing company retains ownership of the asset, it is eligible for the first-year allowances and can therefore take a proportion of this benefit into account when determining the level of leasing charges.

During this period the user pays periodic charges for the right to use the equipment.

At the end of the principal period the user will normally have the right to extend the period of the lease, but no obligation to do so. The equipment remains the property of the leasing company.

Customers can purchase components from one source, a policy whose success is proved by the 100% annual growth rate over the next two years. Hence the still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.

It is natural that a company emerging from Office Systems — Hamilton's early life was based on IBM typewriter rental — should still value that sector highly.

The company still caters for the

short lead time stems from Hamilton's opening several UK branches and overseas offices in Paris, Dusseldorf and New York.

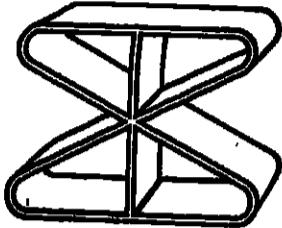
Hamilton offers rental periods ranging between one month and a year, enabling it to match even the most unusual customer requirements.



# Appointments

THE NEWSPAPER COMPUTER PEOPLE RELY ON

# Appointments



## Senior Analysts

Remuneration **c. £11K**

## Software Programmers

Remuneration **c. £11K**

## Senior Programmers

Remuneration **c. £10K**

Scandinavian Bank Limited was incorporated in London nearly 12 years ago, by an association of the leading banks in Scandinavia, and has since become firmly established as one of the City's major international merchant banks. We are currently developing an advanced on-line banking system. Some projects are already live but, with our continued expansion, the development commitment is substantial. We currently operate a duplexed mainframe environment with an IBM 4341 and a 370/138, the latter to be replaced by a second 4341 in March. The TP network consists of Communication Controllers, VDUs and Remote Printers.

The following vacancies need to be filled.

**Senior Analysts** Since you will be involved in the design of sophisticated on-line banking systems, several years' design experience in a banking environment is essential. Knowledge of IBM hardware and TP systems, though not essential, is preferred, as is the ability to work with a minimum of supervision.

**Software Programmers** You will have full responsibility for the generation and support of CICS/VSE. It is essential, therefore, that you have experience of at least one CICS generation. Knowledge of DOS/VSE or DOS/VSE an added advantage.

**Senior Programmers** Several years' experience of COBOL in a DOS/VSE environment with COMMAND level CICS essential. Knowledge of ASSEMBLER and/or RPGII an advantage.

Remuneration will be commensurate with experience and, in addition, the normal banking benefits are available. Apply in writing or telephone giving details of experience to: M. L. Mehta, Head of Data Processing, Scandinavian Bank Limited, 36 Leadenhall Street, London EC3A 1BH. Telephone: 01-481 0565.

## Scandinavian Bank Limited

### ROCHFORD DISTRICT COUNCIL

#### COMPUTER MANAGER

The Council has agreed to set up its own Computing Centre.

Applications are invited for the above post which is likely to command a salary circa £13,000 + attractive benefits.

Applications are required by 6th February 1981. Further details obtainable from: Arthur G. Cooke, IPFA, FRA, Chief Executive, Rochford District Council, South Street, Rochford, Essex, SS4 1BW. Tel: Southend 546368. Fax: 200.

### UMIST

#### PROJECT OFFICER

For immediate application to the University of Manchester Institute of Science and Technology, for the Management of a major project in the area of the development of a new generation of computer systems for the defence industry. The project is to be undertaken in the Department of Computer Science and the Department of Mathematics.

Applications should be sent to the Head of the Department of Computer Science, University of Manchester Institute of Science and Technology, PO Box 26, M13 9PL, Manchester, England.

Applications should be submitted by 1st February 1981. Interviews will be held on 1st March 1981. Salary £13,000 + 10% increments.

## OPERATORS SAUDI ARABIA

### SHIFT LEADER c. £6000 p.a.

We are looking for a person in their early twenties who has a minimum of two years experience as a Senior Operator or Shift Leader in a DOS/VSE system. Our current system is IBM 4331 and we also operate an IBM 3771.

Experience of VTAM, CICS and Q/S JCL will be preferred.

Shifts are of 12 hours' duration and 10 days are worked over a three week rota. Pay allowances are paid and other benefits include free residential accommodation, including swimming, tennis, squash and many clubs and societies.

If you are interested, please contact:

Pauline  
Management Advisor,  
Sunlife of Canada,  
2-4 Computer Street,  
London, SW1Y 5BB.  
Phone 01-580 5400 ext 222.

Jubail from Saudi to City  
RECRUITED

Sunlife of Canada

## COMPUTER WEEKLY

Classified Department, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Box Number: Should be addressed to the box number on the advertisement. e.g. Computer Weekly at the above address.

Classified Rates: £19 per sec.  
10 x 3 cols - £17.25 39 x 3 cols - £1.470  
Half Page (15 x 3 cols) £1.510  
Full Page (39 x 7 cols) £2.400

Copy Deadline: 10pm Monday (just  
Thursday publication date). Complete air back  
up to 11am Tuesday. Advanced space  
reservation is advisable.

LONDON 01-661 0121 (8 lines)  
David - Assistant Classified Manager  
Neil McBurnie - General Supervisor  
Ian Faus - Consultancies  
John Marshall - Consultancies  
Gillian Johnson - General Appointments  
Kevin McWhin - General Appointments  
Peter Rege - General Appointments

MANCHESTER/GLASGOW

Owen Kelly 061 872 8861

Graeme Akers 061 872 8861

BIRMINGHAM/BRISTOL

Vic Shatto 021 356 4818

Classified Production 01-661 3500 Ext  
3104 Steve & Peter

## MYRIAD

# IBM + DEC IN UXBRIDGE

### ANALYST/PROGRAMMER c.£9,000

To be involved with a range of commercial systems, this person will have the capacity to operate effectively as a senior programmer and/or systems analyst as he/she may well be asked to perform both these roles on different projects running concurrently. A clear understanding of COBOL is required and preference will be given to applicants with IBM experience.

### SEN. DATABASE PROGRAMMER

£ NEG.

The successful applicant will understand IMS and will have developed on-line systems in a commercial environment. He/she will join a small group currently investigating the areas in which IMS can be of most benefit and on-line facilities will be incorporated in many systems. Additionally, the Senior Programmer will design new systems and advise project teams on technical matters relating to IMS.

### DEC SYSTEMS PROGRAMMER

c.£10,000

The recently installed PDP 11/70 (1 1/2 MEG) complements the IBM mainframes and will support twelve remote sites. We are seeking a person to refine and further develop the distributed processing network and require someone with software experience using BASIC +2 at an RSTS/E installation. RMS and FMS are highly desirable but applicants with a hardware and telecommunications background will be equally considered.

### SYSTEMS ANALYST c.£9,000

The Systems Analyst will be responsible for identifying user opportunities, preparing business proposals, planning project requirements/resources and gaining user approval. During development, he/she will have regular contact with user management. A good knowledge of the Company's policies and a thorough understanding of systems interfaces will be maintained.

IBM mainframes and DEC equipment provide real-time processing and database facilities to a large number of users within this highly respected, international organisation that is renowned for the quality of its products. The Company is proud of its reputation as an employer offering a secure and positive future; a first-class pension scheme, staff restaurant, generous relocation expenses and many other staff benefits.

REF: S1/2201

## ANALYST/PROGRAMMER

### BASIC OR PL/1

### HARROW

### MIDDLESEX

### To £8,500 + BONUS

A range of new projects involving the use of real-time and database software and IBM 370/DEC PDP and Mjoro hardware has now been scheduled for development by our client.

A vacancy exists for an Analyst Programmer with around two years' commercial BASIC or PL/1 programming experience to become responsible for one of these projects and liaise with the User through all phases of development. Candidates offering experience in one of these languages will be required to become proficient in the other.

The wide range of business activities will offer candidates an interesting career path in systems development.

Our client is a high successful commercial organisation and the starting salaries are further supported by an attractive package of benefits.

REF: NW1/2201

## MARKETING SYSTEMS

### CO-ORDINATOR

### CITY

### To £8,500 + PROFIT SHARE

This position presents an outstanding opportunity for an ambitious ANALYST/PROGRAMMER to take responsibility for the analysis and co-ordination of clients' systems requirements, identify areas of improvement and direct the implementation of recommended solutions.

If you can offer:

\* Good IBM COBOL

\* Some Analysis experience

\* Good communications skills

Then our client can offer:

\* Systems design, analysis and implementation

\* Client liaison and staff responsibility

\* Rapid career progression

Joining one of the world's leading business organisations you will be involved with a range of unusual and interesting marketing applications on behalf of clients whose business activities encompass a broad spectrum of industry.

An excellent commencing salary is further enhanced by a range of fringe benefits including a good pension scheme and substantial profit share together with a career path offering senior main-line managerial opportunities.

REF: E1/2201

## MYRIAD APPOINTMENTS LIMITED

30 Fleet Street, London EC4Y 1AA Telephone 01-353 0981 24 hours

# Sometimes it's hard to tell the Goodies from the Baddies in this industry!

The Computer industry has more than its fair share of quick-quid cowboys. Outfits who are full of precious little talents. Software consultancies that promise you the cream of mind-stretching, but send you on a series of mindless routine treks. Companies that are going nowhere fast.

The snag is, it's so often darned hard to tell the goodies from the baddies. So, in case you think there is another of those so called cowboy outfits, just follow our trail of success.

Space communications and  
Satellite tracking systems ————— Branded 'TOP SECRET'  
Complex transition conversions — Blue chip clients  
Hotel Management ————— Our own CHAMPS system

Systems design, real-time projects, feasibility studies, hardware/software evaluation — all successfully undertaken by our posse of dedicated professionals. No wonder we have become one of the leading independent software houses in the country. This success has led to rapid expansion and growth. To meet these demands we require further top calibre personnel.

## WANTED

Senior Programmers  
Programmers & Analysts  
Minimum 2 years experience on:  
IBM OS or DOS (COBOL)  
Honeywell Level 6 (Screenwrite)  
ICL 2900 VME/B (COBOL)  
CICS or IMS database

Any Voice and Data Communications Analysts should also join the Marco! posse and see why our home spun philosophy has attracted the support and loyalty of the top trail-blazers. Isn't it time to hitch your wagon to a winner and join up with us?

Phone now or write to:  
Penny Bailey  
Marco! Computer Services Ltd  
60 Queens Gardens, London W2  
Tel: 01-402 9355 (24 hour service)

**Marco!**  
Communication and Information

Computing  
Services  
Association



# Move into Software Development

## Salary to £12,000 per annum

Our Client is a major computer manufacturer in the process of further expanding its research and development facility in an attractive provincial location to the North of London.

Among the more important projects scheduled for development during 1981/2 is the design and implementation of a Data Dictionary package.

The ideal candidate will have around five years experience in commercial dp, having practical involvement in Database and possibly transaction processing systems. Experience within a database administration team would be an advantage as would an awareness of both structured design and programming and an interest in systems software.

Our Client's policy is one of maintaining close contact with the needs of the commercial User. It must be stressed that we are seeking someone with extensive commercial experience, probably a COBOL User, who has made a conscious decision to become more deeply involved in systems programming and is seeking a future in the development of software bearing relevance to the general needs of the User environment.

The attractive salary offered reflects the importance of the position within its development team and prospects for advancement exist for outstanding applicants.

Superb conditions of employment are available including free BUPA membership, a contributory pension scheme, a staff share purchase plan and a full relocation package.

To obtain further details, contact our Advising Consultant, Ian Payne on 021-236 3781 (24 hour answering service) or 0827 282480 (evenings and weekends).



London 01-935 0871 3 Mandeville Place, Wigmore Street, London W1M 5LB  
Birmingham 021-236 3781 35-37 Great Charles Street, Queensway, Birmingham B3 3JY  
Manchester 061-833 0427 Blackfriars House, The Parsonage, Manchester M3 2JA  
Brussels 010 322-640 7181/71 Avenue Louise 327, Boite 4, 1050 Bruxelles

Specialist Computer Recruitment Ltd

Computing Services Association

(4150)

## ABU DHABI NATIONAL OIL COMPANY

### OPPORTUNITIES FOR DATA PROCESSING PROFESSIONALS

Abu Dhabi National Oil Company is one of the major national oil companies in the Middle East, controlling the exploration, production and distribution of oil, gas and associated products. Our Data Processing Services (DPS) Directorate has installed two large ICL 2900 Computers together with Network facilities to support the needs of more than ten Companies within the Group. DPS has developed / acquired computer systems for business applications in the areas of inventory, marketing, personnel, finance and order processing. For scientific applications, applications cover all the major areas of exploration, production, process engineering, and well history data base. Our plans are ambitious and our resources are impressive. We need to complement our existing D.P. Team with additional Computer Professionals who will be engaged in a wide range of activities.

#### WE OFFER:

- \* Involvement with the latest Hardware and Software Techniques.
- \* Attractive and competitive salaries and benefits.
- \* Furnished family accommodation.
- \* Relevant academic background and professional experience.
- \* Dedicated and result oriented people.
- \* ICL equipment.
- \* ICL 2900 Software (VME/B) and products.
- \* Database techniques (IDMS and DDS).
- \* Transaction processing.

#### SENIOR SYSTEM ANALYST:

The candidate should have a B.Sc. in Computer Science or equivalent with six years' experience in System Analysis.

#### SYSTEM ANALYST:

The candidate should have a B.Sc. in Computer Science or equivalent with four years' experience in Systems Analysis and Programming.

#### ANALYST/PROGRAMMER:

The candidate should have a B.Sc. in Computer Science or equivalent with three years' experience in Data Processing including one year in Systems Analysis. Good knowledge of Cobol.

#### PROGRAMMER:

The candidate should have a B.Sc. in Computer Science or equivalent with two years' experience in Programming and Data Processing. Good knowledge of Cobol.

#### PERSONNEL DIRECTORATE—(EMPLOYMENT DIVISION):

The candidate should have a B.Sc. in Computer Science or equivalent with two years' experience in Personnel Management.

#### SUPERVISOR SPECIAL PRODUCTS:

The candidate should have a B.Sc. in Computer Science or equivalent with six years' experience in Data Processing including at least one year in a supervisory capacity. Knowledge of IDMS/X/200 and T.P.M.S./200 is essential.

#### SYSTEMS ENGINEER:

The candidate should have a B.Sc. in Computer Science or equivalent with four years' experience in Data Processing work, with good knowledge of T.P.M.S./200, IDMS X/200.

#### ASSISTANT SYSTEMS ENGINEER:

The candidate should have a B.Sc. in Computer Science or equivalent with two years' experience in Systems Engineering, preferably on large Computer Terminal Network.

#### COMPUTER OPERATOR:

The candidate should have completed Secondary Education, plus formal training on ICL 2900 range of computers, with two years' experience in computer operations (preferably large 2900 installations with on-line operation facilities).

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your resume, tel. 0237 470000, International Software Support (UK Division), 217/218 Tenterden Court Road, London, W1P 5AP.

For more information, please get in touch with us with your



JBA

**Consultants**

**London/Midlands** Neg. from £12,000  
 This prestigious Consultancy Organisation is in the process of recruiting top class DP professionals to work on various commercial and production control projects. Candidates must be aged between 25-35, ideally possess a degree or professional qualification and be used to working independently. They need technically accomplished individuals who have a thorough appreciation of both mini/micro and mainframe equipment coupled with sound experience of systems design through to implementation. An excellent salary is supplemented by attractive fringe benefits (car, BUPA etc) and the opportunity to travel throughout the U.K.  
 Contact: Isobel Bruce

**Project Leader**

**Paris Suburbs** c. £160,000 p.f.  
 We have been retained by a well established commercial organisation to recruit a Project Leader to take responsibility for the development of new minicomputer-based systems. Candidates, who should be French and have a good command of English, must be able to demonstrate several years of successful project management. The ability to motivate technical staff and deal effectively with user management is more important than deep computer knowledge. We are really looking for a mature individual with a good degree from a recognised French University and an outgoing personality to deal with staff at all levels. Excellent salary and career prospects.  
 Contact: Jim Baker

**Software Manager**

**London** £10,000  
 This is a good opportunity to join a well established microcomputer manufacturer who cover a variety of end-users and OEM customers throughout the U.K. and overseas. Systems run on a version of the CP/U operating system, and support BASIC, FORTRAN and COBOL with a growing range of other system software. Applications are commercial, scientific and data communications. Background must consist of sound knowledge of hardware/software with emphasis on microcomputer software.  
 Contact: Janet Chivers

**HP3000 Software Specialist**

**London** Neg. to £10,000  
 SCICON has an unsurpassed reputation for its technical ability and expertise in the development of advanced systems and software. To meet the demand for efficient and versatile systems they now require an experienced Hewlett Packard software technician to provide system support to the development teams. Responsibilities will also include the management of in-house machines. To qualify for this position candidates will have at least 2 years practical experience of HP3000 and have an in-depth knowledge of the internals of MPE, IMAGE and QUERY. An appreciation of the hardware structure and the ability to configure systems would be desirable assets. An excellent opportunity to progress in a challenging and professional environment.  
 Contact: Margaret Stevens

**Senior Programmer**

**City** £9,000 +  
 Ideal opportunity to join a well established financial organisation who are in the process of installing two DEC II/70's. To apply, it is essential to have at least two years experience in a DEC environment using BASIC, +BASIC +2, also to have good knowledge of financial applications, plus the ability to deal with users and their problems. Promotion prospects are good as this is a new and developing installation.  
 Contact: Janet Chivers

**Support Analyst/Programmers**

**Herts** c. £9,000 Package  
 Due to internal promotions and steady expansion, our Client wishes to recruit experienced Analyst/Programmers on small systems. To undergo intensive product training and then head a project team, to develop in the areas of complete turnkey systems, specific software packages and tailor-made systems, you will be responsible for assessing client requirements, designing, amending and implementing the desired packages and taking charge of post-sale support for your team. A strong commercial systems analysis and programming background on small business systems, plus the ability to co-ordinate and control a project, some exposure to micro-based systems would be advantageous.  
 Contact: Brian Peartie

**Programmers**

**Bucks** up to £9,000  
 Our Client, an expanding systems consultancy, are looking for a number of programmers to design and develop specialised software for turnkey and on-line projects. Applicants should have a minimum of one year's RPG, COBOL or CORAL, or any other standard high level language.  
 Contact: David Meadley

**Analyst/Programmer**

**South London** £8,250  
 Our Client, a large international organisation who are component makers to the European industry, are currently strengthening their R&D team and so have a requirement for an experienced Analyst/Programmer. Candidates should have a sound knowledge of RPG/II with some exposure to COBOL. An excellent track record in IBM environment, basic terminal handling procedures would be an advantage.  
 Contact: David Meadley

**JAMES BAKER ASSOCIATES**  
 International Personnel Consultants  
 50 Savile Row, London W1  
 Tel: 01-438 5511

**TECHNICAL MARKETING ANALYST**

Circa £10,000 p.a.  
 + Company Car

MODULAR COMPUTER SERVICES is a European leader in the supply of computer systems to the communications and industrial market places. We are a young dynamic Company with a rapidly expanding marketing organisation and as part of this expansion we are looking for a TECHNICAL MARKETING ANALYST to join our existing team in our U.K. Headquarters in Coventry. Suitable candidates will have a technical background on minis and will probably have held senior positions in projects implementing real-time systems in industrial or communications applications. The right person will be an enthusiastic committed individual capable of providing our sales force with comprehensive technical support. This role may suit a software specialist with both Assembler experience and proficiency in a high level technical language who is looking for the challenge of a demanding pre-sales environment.

This position carries attractive Company benefits including a non-contributory pension scheme, free life assurance and free BUPA.

For further details or an application form ring SUE HAMPSON on Wokingham 788711 or write to MODCOMP, Molly Millars Lane, Wokingham, Berks.

(4127)

**MODCOMP**

**SYSTEMS ANALYSTS**  
 £6500 to £10500      **PROGRAMMERS**  
 £5500 to £8500

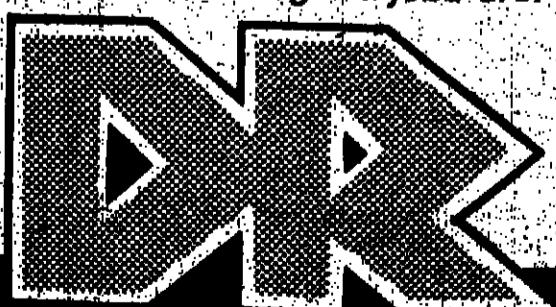
Contact: North and Midlands  
**CATHY SCOTT**

Telephone: 0423 55311

Contact: Scotland  
**IRENE WEBSTER**

Telephone: 041-226 4912

'We know where the good jobs are!'



DATA RESOURCES AGENCY

Recruitment Agency  
 P.O. Box 53, 8th Floor, Copthall Tower House, Harrogate HG1 1TS  
 Tel: (0423) 55311/2  
 Central Chelmsford, 11 Bothwell Street, Glasgow G2 6LY Tel: (041) 226 4912  
 (24 HOUR ANSWERING SERVICE - 0423 55311/3)

**OPPORTUNITIES - NORTH EAST ENGLAND****SYSTEMS PROGRAMMER to £8500**

A major IBM user with an ambitious systems development plan wishes to recruit an additional Systems Programmer. The appointment is part of a small, but highly motivated technical support group who are responsible for all software support within the organisation. Experience is required of SOME of the following IBM software which is in use within the department:

\* CICS      \* OS/VS1      \* NCP  
 \* DL/1      \* MVS      \* VTAM

The successful candidate would be offered a salary commensurate with his experience and our client will pay a full relocation package if appropriate.

To apply and find out more details contact Ivor Norton quoting reference CW/8102 at the Harrogate address.

**NETWORK SUPERVISOR to £8500**

A large scale computer user, in the early stages of establishing a major nationwide network linking the data centre to Group subsidiary companies, wishes to recruit a Network Supervisor.

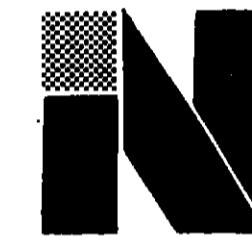
This position carries the following responsibilities for the network:

\* planning      \* equipment      \* costing  
 \* configuring      \* evaluation      \* general technical  
 \* scheduling      \* back-up

Candidates must have an operations/hardware background. Previous experience in planning, establishing and supporting a significant network is essential for this key position. Excellent salary and comprehensive relocation package available to the successful candidate.

Interested? Contact Ivor Norton quoting reference CW/8101 at the Harrogate address.

**Ivor Norton Management Services Ltd**



LONDON  
 52, Shaftesbury Avenue,  
 London W1V 7DE  
 01 734 8862

HARROGATE  
 P.O. Box 63, Copthall Tower House,  
 Harrogate HG1 1TS  
 01 226 4911

GLASGOW  
 11 Bothwell Street,  
 Glasgow G2 6LY  
 041 226 4911

RECRUITMENT CONSULTING DIVISION

24 HOUR ANSWERING SERVICE  
 (0423) 55311

**Somerset**

COUNTY TREASURER'S DEPARTMENT

**COMPUTER AUDITOR**

£8481-£9411

The Council currently operates an ICL 2866 computer which will be replaced in September 1981 by an ICL 2966. A computer auditor is required following the advancement of the career of the present postholder. Applicants are required to have practical technical experience of computers including a knowledge of programming and systems analysis, must be able to communicate effectively with management at all levels and, ideally, would have an appreciation of accounting or audit disciplines.

The postholder is responsible to the Chief Internal Auditor and is expected to make a major contribution towards the efficiency and effectiveness of the Council's financial control systems, including the physical and operational security of the computer installation; the appraisal and development of new applications, enhancements to existing applications; the confidentiality of data and the provision of an information service to assist the audit function, if general.

The post is suitable for a computer specialist. Ideally, applicants should have financial experience.

Applications, stating age, experience, education, present employment and the names of two referees to:

County Treasurer (Ref. JS/HP), County Hall, Taunton

Prospective applicants wishing to discuss the post should ring Tony Parr on Taunton 73451, Ext. 638.

Closing date: January 30th, 1981.

**HEXAGON****PL/1 PROGRAMMERS**

C. London, S.E. and N.W. Home Counties.

**Mk. IV PROGRAMMERS**

Top rates in C. London and Kent. Indefinite Contracts.

**CICS/COBOL PROGRAMMERS**

Also Senior Programmer/System Designers, South, Central and W. London, Berkshire.

**BANKING ANALYSTS**

On-line real-time international applications.

**OS/COBOL PROGRAMMERS**

Opportunity to gain IMS Exp. on manufacturing or financial systems. Central and W. Home Counties.

**PDP RSX 11 PROGRAMMERS**

Any high level language exp. Kent.

**HP COBOL PROGRAMMERS**

C. London and Bedf. R/T airline system.

**HONEYWELL LEVELS 6, 64, 66 COBOL PROGRAMMERS**

Prefer screenwriter or IDS/TDS. To work on latest 8100 conversational systems.

**REDIFON EDITOR PROGS.**

For 3/6 month London Contract.

To discuss these and many other contract opportunities, please call any weekday up to 8 p.m.

**CONTRACT DIVISION****IMS COBOL PROGRAMMERS/ SYSTEMS DESIGNERS**

C. London, Surrey and Kent.

**BUSINESS SYSTEMS ANALYSTS**

Product Order Costing System. W. London and Middx.

**UNIVAC 1100 EXEC. 8****CONTROL PROGRAMMERS**

Essex. All Commercial Applications.

**DOS/COBOL PROGRAMMERS**

Central and North London. Prefer VSAM. Exp.

**SNR. CICS/PL/1 PROGRAMMERS**

To work on latest 8100 conversational systems.

**HONEYWELL LEVELS 6, 64, 66****COBOL PROGRAMMERS**

Prefer screenwriter or IDS/TDS.

**REDIFON EDITOR PROGS.**

For 3/6 month London Contract.

**COMPUTER WEEKLY CLASSIFIED**

**DIRECT LINE 01-661 0121**

**the newspaper computer people rely on**

**DURHAM COUNTY COUNCIL**  
**DARLINGTON COLLEGE OF TECHNOLOGY**  
 PRINCIPAL: R. EKELBY, M.A.(Oxon), MInstP, FRSA

REQUIRED ON 1st MAY OR AS SOON AS POSSIBLE THEREAFTER

**LECTURER GRADE I**

IN COMPUTING, to teach on BEC/TEC, NCC and GCE 'O' and 'A' LEVEL courses. Experience of computer operations, systems and of operating procedures would be an advantage.

SALARY SCALE: £4,682-£5,200

Application forms and further particulars (available by 20th February 1981) obtainable from the Principal, College of Technology, Cleveland Avenue, Darlington DL3 7BZ, on receipt of a stamped, addressed, envelope.

If you're on form...  
...fill in this one.

Computer  
recruitment

If you're performing really well in your present job, you'll be keeping your eyes open for something better.

But being a top performer, you've got better things to do with your time than pore over pages of job ads and make dozens of phone calls.

So to save time, and to get yourself lined up for some of the best jobs going, just fill in our application form.

We'll then get back to you fast with details of jobs that are exactly right for you.

**Personal.** Please write in ballpoint, using block capitals.  
Surname \_\_\_\_\_ Forenames \_\_\_\_\_ Mr/Ms \_\_\_\_\_  
Address \_\_\_\_\_

Tel. Home \_\_\_\_\_ Office (dialling will be used)  
Age \_\_\_\_\_ Nationality \_\_\_\_\_ Car? \_\_\_\_\_  
Are you prepared to relocate in UK?  Abroad?  (tick box)

**Experience** Place no. of years in box,  
e.g. IBM 360/370 4

**Machines:** Please specify model.

IBM 360/370

IBM others (specify) \_\_\_\_\_

ICL 1900/2900

ICL others (specify) \_\_\_\_\_

Honeywell

Univac

Burroughs

DPD

Other mainframes \_\_\_\_\_

Other mini-computers (specify) \_\_\_\_\_

**Languages:**

Cobol

Pascal

Assembler

PL/I

Fortran

Pascal

RPG II

Auto/easy/user code

Others (specify) \_\_\_\_\_

**Operating Systems:**

DOS

OS

George (specify) \_\_\_\_\_

CICS/HASP/GRASP

DB2/DB/IMS

CMS

Others (specify) \_\_\_\_\_

Other (specify) \_\_\_\_\_

**Position Sought:**

Please state briefly the type of appointment you are seeking.

Contract?  Permanent?  Either?  (tick box)

Minimum salary? \_\_\_\_\_ Notice required/Date available \_\_\_\_\_

Signed \_\_\_\_\_

Check the whole advertisement and post to the address below.

**Knight**

Knight Computer Services Ltd.

01-914706

THORBAR  
A DIVISION OF INBUCON MANAGEMENT CONSULTANTS LIMITED

WEST MIDLANDS  
TECHNICAL CONSULTANT —  
CIRCA £7,000 PER ANNUM  
OPPORTUNITY FOR YOU TO  
DEVELOP YOUR CAREER IN THE  
MINI/MICRO COMPUTER FIELD

Inbucon Management Consultants Ltd. are looking for a Technical Consultant to work on a wide variety of projects throughout the U.K. concerned with the design and implementation of Mini/Micro systems. Ideally the successful candidate will be able to meet most of the following requirements:

1. Minimum of one year's programming experience (ideally BASIC), working with Micros and/or Minis.
2. Experience of working in a Manufacturing environment and some knowledge of Industrial Engineering.
3. An Engineering background, preferably supported by a degree.
4. Aged around 25/30 years.

Founded in 1926, Inbucon is a major International Consultancy employing over 700 Consultants and professional staff providing a comprehensive range of services to Industry, Commerce and Government. There are good opportunities for the right person for self-development and career progression in the Company's expanding Computer Consultancy and Advanced Technology Group.

PLEASE CALL OR WRITE NOW  
FOR AN EARLY INTERVIEW

ASSOCIATE DIRECTOR: JIM HEWARD

INBUCON MANAGEMENT CONSULTANTS LIMITED  
46 Poplar Road, Solihull, West Midlands B91 3AG  
Telephone: 021-705 6414

Ref. CW/5/81

INBUCON

SCHEDULER/  
SENIOR OPERATOR

Our Head Office is based at Matlock on the fringe of the Peak District. The Computer Department is equipped with a large ICL 2904 installation operating under George 2+ and MTS.

Scheduling and ancillary functions constitute the major involvement, but operating and some staff training will also be a requirement. It is anticipated that candidates will need at least 4 years' relevant experience. This is a demanding position within a small but very active department.

The position offers an attractive salary together with excellent conditions of employment and working environment.

For an application form or further information please contact:

Miss C. M. Smithers, Personnel Assistant, Tarmac Roadstone (Northern) Limited, John Hadfield House, Dale Road, MATLOCK, Derbyshire.

TELEPHONE: MATLOCK 3456 EXT. 358

**Tarmac**  
ROADSTONE

MODUS

International Personnel Consultants  
Modus Management Services Limited  
148 Watling Street, Radlett, Herts. WD7 7JH  
Telephone: Radlett (09276) 3077

**WE NEED ANALYSTS!**

Yes we need real Systems Analysts. People who excel at extracting information from a multitude of users, people who can gain the full confidence of user departments, including senior and operational staff, helping them find out what they want and helping them to decide what they really need. A military system background would help but is not a pre-requisite.

**£10,500-£13,500**

Plus benefits package which includes: Bupa, free season ticket loan, relocation expenses, pensions, etc.

**Systems Concepts**

Imagine the scope and freedom an Analyst really needs to do his or her job properly. The freedom to encourage users to give information without the restriction of a pre-conceived sizing of the machine or installation or system, the freedom to produce a totally comprehensive requirements specification, the scope that comes naturally from being there to analyse rather than impose a solution, the additional freedom that results from having a first-class team of software and communications designers to back you up. How often have you worked in conditions as ideal as these?

The task our client has set is as comprehensive as these parameters indicate. The decisions to be made from your work will identify not only the detailed aspects of the system design but also the benefits to be derived from a computerised solution, the costs such a project would incur and the time-scales for implementation.

What is certain is that the system will be multi-user and multi-locational and that the most up-to-date technology will have to be used. The overall objective is an extremely exacting one to achieve.

Interested? Your career may need the kind of boost that working on this system will give. The company you would be working for is recognised world-wide as one of the very best, as well as being one of the largest in the computer industry. Your security and professionalism cannot help but be enhanced.

Contact: Andy Wright or Mike Creamer

**Professional Background**

Your experience to date must indicate sound, thorough Analysis — not just design and programming. Most people at this level will have taken responsibility for a substantial system development and we will expect to see some evidence of flair, imagination and self-reliance. A degree or equivalent professional qualification would be a considerable asset, whilst knowledge of such techniques as data analysis, extremely welcome.

In view of the growth factor and the way in which our clients assign staff to project work, there is no doubt that there will be progressively more room for extremely senior consultancy and project management positions as time passes. Additionally, our client's approach to project control and system design is entirely modern and exposure to these methodologies is certain to enhance and increase individual professional capabilities.

Opportunities exist within, or heading-up, the various design teams and the positions would suit applicants who are already at Senior Analyst level.

**PROGRAMMER?  
BECOME A TECHNICAL CONSULTANT  
LOOK WHAT IT TAKES!**

**IMMEDIATE  
SALES  
OPPORTUNITIES**

with manufacturers of:

- Data collection and communications systems. O.O.E. £18+. Mid and North.
- Minicomputers, major A/L Sales. O.O.E. £17+. North.
- Minicomputer systems. Area sales. £20k+. North and Midlands.

Contact immediately, quoting JV8/JB

Insight Marketing  
and Personnel  
Consultants Ltd  
101-103 High Street, Matlock  
Derbyshire DE4 2AB. Tel: 01629 520261

Tel: 061  
236 7026

**COBOL PROGRAMMERS?  
PROGRESS NOW TO SENIOR PROGRAMMER**

**YOU KNOW WHAT YOU ARE  
WE KNOW WHAT YOU CAN BECOME**

If you feel you are a suitable candidate for any of these opportunities, don't hesitate, contact:

Join the Association of IT Professionals, 101-103 High Street, Matlock, Derbyshire DE4 2AB. Tel: 01629 520261

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

For more information, just get in touch with Alan at 0161 221 0127

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)

or write to Independent Software Support (102, Oldbury, 217-219, Oldbury Road, West Bromwich, West Midlands B70 1JL)



Q

A user dept with its own IBM 3033's?

And paying salaries up to £20,000 p.a. after tax?

The answers are definitely yes; and what's more, they will have their own purpose built computer centre ready for occupation towards the end of this year.

**OCC** OCC computer personnel  
01-242 9356 24 hour answer service

## OPERATIONS CONTROLLER

- ★ IBM 370 plus minis
- ★ Full day to day responsibility
- ★ Northampton based
- ★ Salary to £7,000 p.a.

This is an excellent opportunity for an IBM operator to take the first step up the management ladder.

As Operations Controller you will supervise eight staff on our client's IBM 370/138 running under DOS/VSE plus Vertek minis.

You should have in-depth operational experience on IBM hardware, you would be responsible for the efficient performance of all staff and equipment in the operations area. The ability to communicate effectively with user departments is also an important part of the job.

Full in-house training with the possibility of future advancement make this a real career opportunity.

Our client is a wholly-owned subsidiary of an American company with a turnover of £40m per year. They have four UK offices with the headquarters in Northampton.

They offer an attractive package including five weeks' holiday, subsidised restaurant and relocation assistance, no super rates. For more details call Steve Baker or write to him at:

**CASTLE**  
SEARCH & SELECTION

ECU House, Park View Road,  
Berkhamsted, Herts  
Phone: (04427) 24241

**COMMUNICATION SPECIALIST**

**WORD PROCESSING**  
Excellent Remuneration plus Car

We require specialists in the London and Manchester areas with a minimum of 18 months computer experience, who have had involvement in or exposure to one or more of the following:

**TELECOMMUNICATIONS**   **WORD PROCESSING**   **ELECTRONIC MAIL**  
**REAL TIME PROGRAMMING**   **TERMINAL EMULATION PROGRAMMING**   **TIME SHARING SUPPORT**  
**MESSAGE SWITCHING**

The successful applicants will be required to work in a support role which will involve pre and post sales customer involvement, communications programme installation, evaluation and enhancement, AES word processors, from stand alone to shared logic. Ideally all applicants should have experience in word processing, but full training will be given in all the relevant areas. Proven experience in a customer support role will be a distinct advantage.

Reporting directly to the Communications Manager you will become an integral part of the communications team which has been created specifically to promote and support AES WORD PROCESSING in the fully integrated electronic office of tomorrow - today.

Other benefits include full working expenses, life insurance, four weeks annual holiday and associated public holidays.

Write or telephone for an application form to:

Mark Robson, Communications Manager, AES DATA (UK) Ltd,  
27/29 Fitzroy Street, London W1P 5AF.

**COMPUTER WEEKLY CLASSIFIED**  
DIRECT LINE 01-661 0121  
the newspaper computer people rely on

The machines will be dedicated to the Petroleum Exploration Division, which signifies the importance of this area of our client's activities. As one of the largest companies in the world, you can be assured of excellent career and financial rewards.

During early 1981 we will be looking for the following:

### Systems Programmers Capacity Planners Data Base Specialists

There will be many other job opportunities during 1981

All people applying should possess a degree or similar qualification, have extensive experience of large IBM systems and be prepared to take up employment in Saudi Arabia.

The package could include:

- An attractive after-tax salary • Free medical care
- Substantial accommodation • Prospects of family status for the more senior positions.

Informal interviews are being held NOW and client interviews will take place at the end of February.

Your first step towards a brighter '81 is to contact Mike Mead at OCC Computer Personnel, 16 Bedford Row, London WC1R 4EB or telephone 01-242 9356.

16 Bedford Row, London WC1R 4EB. Telex 24224 ref. 1163  
Specialists since 1971 in UK and International computer and technical appointments.

Please contact us for assistance and guidance with your next change.

# EPOS. - the power to revolutionise retailing

Not since the advent of self-service has there been proposed such a major development in retailing philosophy as Electronic Point of Sale.

It will provide on-line monitoring and recording of goods inward, customer checkouts, stock control, accounting, merchandising, staff training, in fact everything to increase the efficiency of our stores.

To start with, in the first year, 15 major Tesco stores will each be equipped with:

laser scanners  
micro-processor driven terminal registers  
terminal controllers  
linked to in-store IBM 8100's  
all linked to IBM mainframe at our Cheshunt Data Centre

Think about the career prospects of being one of the first to put in the groundwork on this exciting new project.

Tesco/EPOS could ultimately be the largest, most complex system of its kind in Europe. It will revolutionise both retailing practice and data processing techniques and your contribution to the team that sets it up and keeps it running could be vital to EPOS and your future.

**Senior Programmers**  
up to £10,300 p.a.

**Data Base Analysts**  
up to £13,700 p.a.

**Systems Assurance**  
up to £13,700 p.a.

**Project Leader**  
up to £13,600 p.a.

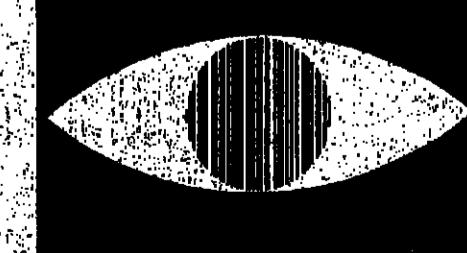
Salaries commensurate with experience

If you have experience with any of the following: IBM, Cobol, Assembler, SPPS2, PLDS, IMS, DPX, TSO, SPF, MVS, NCP, MIP, DATAMANAGER, and are our sort of person, we can here and now offer you real career advancement.

There's big-company prospects to go with big-company salaries plus contributory pension and private medical schemes. Other benefits include relocation expenses where appropriate, subsidised staff restaurant and an active sports and social club.

Take your first step right now, contact Barry Howden, Personnel Department, Tesco Stores Limited, Tesco House, Delamare Road, Cheshunt, Herts EN8 9SL.  
Tel. Waltham Cross 32222.

**TESCO**



Putting EPOS into action.

## SALES EXECUTIVE

### London Area

c. £16,000+

Mouncey and Partners, one of the longest-established Consultancy Software Houses, are expanding their current sales team.

We are looking for a professional salesperson with the following qualifications to sell our various consultancy and development services.

- A proven sales record for several years
- Currently selling in the software/bureau industry
- Ideally selling in the London/Home Counties area
- Aged between 25-35 years with a positive and self-motivating attitude
- Enjoys selling and developing client relationships

Earnings will include a high salary and commission amounting to at least £16,000 p.a. on target sales, plus the following:

- Company car and expenses
- Normal benefits including pension, B.U.P.A., etc.

Interested? Then contact Alan Fenn on 01-486 7777 or write to him at



Mouncey & Partners Limited  
13/14 Cornwall Terrace  
Regent's Park  
London, N.W.1

**DALROTH** computer and partners personnel

## COMMUNICATIONS

**Major Real Time/On Line Projects**  
London - Home Counties - Midlands

A leading International Consultancy Organisation currently wishes to recruit a large number of personnel for 4 major Real Time and On Line projects. Hardware includes large IBM, ICL and Honeywell mainframes, DEC, DC, Tandem, GEC mini plus various Micro Systems. Applications include Command and Control, Military Information Systems and a major commercial system with a large terminal network and Database facilities.

Project phases include Study, Definition, Design and subsequent stages through to operational running.

The following personnel are required:

<b>Project Managers</b>	Up to £18,000 + Car
<b>Senior Consultants</b>	£13,000 - £15,000 + Car
<b>Systems Designers</b>	£10,000 - £15,000 + Car
<b>Consultants</b>	£11,000 - £13,000
<b>Systems Analysts</b>	£9,000 - £12,000
<b>Systems Programmers</b>	£9,500 - £12,000
<b>Programmers</b>	£8,000 - £11,500

For all appointments, experience on large-scale communications oriented projects would be highly desirable, especially at the more senior levels. Specific areas of experience could include:

- ★ Networks - Traffic - Work Load
- ★ Message Switching - Interfacing
- ★ Voice Networks - Electronic Mail
- ★ Security & Access Control
- ★ Military/Command & Control
- ★ Total Systems Design
- ★ Database - Data Analysis
- ★ DBMS/MS
- ★ Financial - Accounting - Auditing
- ★ Control & Quality Assurance
- ★ Large ICL/IBM or Mini/Micro

All appointments offer excellent long-term career prospects with opportunities for travel both in the UK and overseas. Attractive remuneration packages will be negotiated on an individual basis.

Urgent: MVS Systems Programmer for Germany to start 1/3/81 - £480+.

For further details, please contact: Ian Murray West or Roger Allington on 01-499 2847 (office hours) or Milton Keynes (0882) 563415/Berkhamsted (04427) 2289 (evening/weekends).

Quote reference number 8841.

**DALROTH & PARTNERS LIMITED, 4 HALF MOON STREET**

**LONDON W1Y 7RA**

## Analyst Programmer

### Process Control/ Data Acquisition

G. D. Seale is an international pharmaceuticals company based in pleasant surroundings at High Wycombe in Buckinghamshire. A vacancy exists within our R & D Division Computing Department for an experienced analyst/programmer to join a newly formed small department which will be acquiring extensive new computing resources in 1981 to extend the existing PDP11/40 and Hewlett Packard systems. The initial application will be to develop software for controlling and monitoring the processes in our new Biological Development Pilot Plant. Future applications will include the design and development of systems for data collection and analysis in a number of departments within the Research & Development Division. An extension into microprocessor based systems is envisaged.

We are seeking a person with a degree in science (or equivalent) and experience with real time systems who has worked on process control applications and is familiar with DEC minicomputers.

Candidates, male or female, are invited to obtain application forms from

Miss D. Wardman  
Assistant Personnel Officer  
Seale Research & Development  
Lansdowne Road  
High Wycombe, Bucks.  
(Tel: High Wycombe 21124,  
ext. 3374).  
Please quote  
reference CPS

**SEARLE**

(4114)

### COBOL PROGRAMMERS £6-7000/depending on experience IN LINCOLNSHIRE

**The Company:**  
H. Leverton & Co. Ltd. holds the Caterpillar franchise for North East & South East England and operates from 9 locations. The Company sells and provides parts and service support to Caterpillar construction equipment, materials handling equipment, diesel engines and generator sets.

**Operates:**

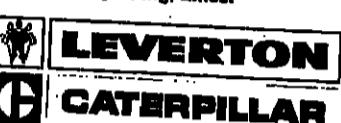
4 MEGABYTE IBM 4341  
Extensive AP Network  
On Line Real Time Systems  
On Line Program Development

Major and Plans Developments to introduce more on line real time systems using fully integrated data base techniques.

**The Position:**

We are seeking to appoint commercial COBOL programmers to be based in Spalding, Lincolnshire, with 2-4 years' experience. Knowledge of CICS or IDMS would be an advantage. The Company is a member of the Unilever Group which includes amongst other business 22 days' paid holiday and a contracted-out Pension Scheme.

If you are interested in being considered please apply in writing giving details of age, experience, qualifications and current salary to: Mrs. D. M. Tutty, Personnel Department, H. Leverton & Co. Ltd., Westgate Street, Spalding, Lincolnshire.



© 1981 H. Leverton & Co. Ltd. • Computer Cables are trademarks of Computer Cables Co.

(4180)

# Has the Milkman failed to deliver?

The milk rounds of Colleges and Universities can be quite a confusing affair. Carrots are dangled, promises made and images of bright futures projected onto unsuspecting minds. It's all too easy to make the wrong choice isn't it?

Do you feel that your career as a Programmer is moving in the wrong direction? Or is it not moving at all? Then consider the growth path we offer in R & D programming.

We are a thriving computer manufacturer with a modern, well equipped research and development centre located in the Northern Home Counties.

Our Company is all about success — and success breeds success.

Our hardware and software products are the most versatile and powerful of their type currently available. Our staff are young, and we actively encourage them to develop their own ideas by providing an ideal environment which fosters creativity.

Our Systems Programmers work in small teams, each member having access to a worldwide network of 66 computers through their own personal interactive terminals.

If you're allowed to develop your own concepts, would that give you the job satisfaction you are seeking? If so, we have a number of opportunities for bright young people with a desire to contribute to the further evolution of data processing techniques.

A degree is not absolutely essential, but you should have some practical experience of a structured language. Most of our work is carried out in PL/I, although if you have a knowledge of other high level languages such as PASCAL, ALGOL or CORAL, we will offer you the opportunity to exploit your interest in systems software.

There are a number of advanced areas in which you could find your initial involvement. These include:

- \*Communications
- \*Transaction Processing
- \*Data Dictionary
- \*Language Processors
- \*Network Management Systems

Promotion can be attained quickly, based on above average performance. Conditions of employment are excellent with starting salaries ranging up to £7,500 per annum, together with free BUPA membership, a contributory pension scheme, a staff share purchase plan and a full relocation package.

Interested? Then call our Advising Consultant, Ian Payne on 021-236 9781 (24 hour answering service) or 0227 282430 (evenings and weekends). We look forward to meeting you.

We offer initially a Model 71 using 16 bit parallel architecture and experience.

For a Northumbrian career with healthy prospects apply to Alan Williams or John Dunleavy, 1000000 64881, 64882, quoting ref. 9/81/10.

The Recruitment Officer  
OXFORD REGIONAL DEVELOPMENT AUTHORITY  
1000000 64881, 64882  
1st Oxford 64881, 64882

Closing date 31st Jan 1981  
Specialist Computer Recruitment Ltd  
London 01-836 0871, 3 Mandeville Place, Wimborne Street, London W1M 5LB  
Birmingham 01-239 1781, 30-37 Great Charles Street, Birmingham B3 3JY  
Nottingham 061-313 9427 (Electricity House, The Paragon, Nottingham NG1 2AA)  
Worcs 010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

010 322 840 7150/71, Avenue House, 327, Soho, 4, 1000 82000

**CISTERNS ANALYSTS**

Near LOOTON to £11,500  
Is your current job driving you round the BEND, feeling DRAINED, BOGGed down? Well get on the BALLCOCK — Analysts from a programming background can expect SEWER fire prospects. Become FLUSHED WITH success. Please ring at your CONVENIENCE. (WC4U2P)

**COBOL**

EC2 to £11.5K  
An ANGEL of a job now waiting for GOODge progs. with 2 years + exp. You can ILFORD to miss this appealing offer ACTON this and receive all the usual BANKING benefits. Maybe a WAPPING great MANSION HOUSE. (PK1409)

**FORTRAN/COBOL**

BERKS. to £8K  
DISC could be AERIAL GROOVE. Our client NEEDLES progs with STYLUS. Fortran or Cobol. HoWOOFER for you look you'll have to go a LONG-WAVE to RECEIVE a TWEETER (PK1219)

**PROGRAMMER**

HERTS to £9K  
Don't be SHEEPish if your Cobol is good, 18 months experience WOOL give EWE a new STATION in life. The opportunity to be involved with analysis would be the next step for ambitious programmers. (PK1302)

**SYSTEMS PROGRAMMER**

CITY to £9,500  
The BALL's in your COURT. NET this ACE job by having 1-2 years' MVS or OS. ADVANTAGE Assembler, CICS, IDMS. If this is your GAME and you can MATCH it we can SET you on the right LINES. LOVE to hear from you. (NW1160)

**SYSTEMS PROG**

W. COUNTRY £10K  
ACNEcations please from anyBODY who NOSE CICS & MVS with an EYE to the future and the CHEEK to FACE and SHOULDER responsibility for the TEE-THING of an IBM 3031 maCHIno. (TH1325)

**SYSTEMS ANALYST**

MIDD. to £10,500  
BOARD where you are? Then DART in on the DOUBLE to see us for this top-FLIGHT job. If you've seen at least one project through you'll have no TREBLE at this ICL site. For all the POINTS with no BULL get the LOWE. (NW1377)

**CHIEF PROG**

MIDD. to £10K  
You can't FORD to disCARD this, if you've 5 yrs. COBOL programming. Online MINIS TRANSMITting to mainframe IBM. Don't doLEYLAND, MAXImise your opporTUNities now. (NW1374)

**ANALYST**

BERKS to £10K  
WHALE this apPIentment needs FINancial and systems experience. PLAICE your project leader-like effISHENCY on the LINE at this IBM site and NET the benefits. SALMON MUST ACT aPRAWN this and give us HER-RING without dEElay. We're WHITING. (JS1307)

**PROG MANAGER**

BUCKS £9.5K  
TACKLE a SCRUMptious job. PUT-IN 2 yrs. supervisory experience, MANAGE and TRAIN a TEAM to PROP program standards. Don't FULL BACK, get in TOUCH with us. Once CONVERTED, you'll be glad you TRY'd. (JS1428)

**PROJECT LEADER**

E. LONDON £11K  
OMELETTEing you know, you SHELL SCRAMBLE to POACH this eggcellent position. not aFRIED to take over a team of 4/5 required for two large systems just coming up. to the BOIL. (TH1396)

**SUPPORT ANALYST**

WEAVE got a Software position TAILOR-made for you — SEW it would SEAM. If you're Support MATERIAL, you'll NEEDLE the Operating Systems exp you can COTTON onto. Device Handling exp would be SUITABLE. (TH1283)

01-404.0162

COMPUTER SEARCH LIMITED  
105 Southampton House, 13 Southampton Place, London WC1

**Informal Interviews**

on Thursday 29th JANUARY  
5.30 pm — 9.00 pm

AT THE  
LADBROKE MERCURY HOTEL  
BAGSHOT ROAD  
BRACKNELL, BERKS.

REAL  
TIME  
SOFTWARE  
ENGINEERS

The first installations in the System X family are currently being put into live service, and many more systems need to be developed to complete the whole range.

The system software teams responsibility is to produce a software package which will be able to be configured for all networks. The data describing a specific network will then be combined with this 'generic' suite to produce the software package for the installation.

These activities require an unusual combination of real time software ability and system awareness and represent a unique challenge to the software engineer.

Salaries and benefits, which include in house medical and dental facilities, relocation packages, pension schemes, on site sports and social clubs are excellent, with the prospects of progressive careers in an expanding and successful company at the forefront of technology.

Come along and have a drink and chat with our client, a major company on the South Herts border. Meet the specialists involved, discuss the technology and your future prospects.

If you are unable to attend don't hesitate to telephone or write.

Carlton PERSONNEL SERVICES

58 High Street, Biggleswade, Beds. Telephone: 316622 or Letchworth 3097 evenings and weekends.

**COMPUTER WEEKLY**

Two Software Reporters  
£7,500 and £6,375

tax-free reading allowance  
of £250 pa in each case  
(salaries due for review on April 1)

Britain's biggest computer newspaper needs two specialists to strengthen its software coverage and write general news stories.

Applicants should either:  
have programming experience and be confident of their ability to write quickly and succinctly for an expert readership;  
or:  
have a background in journalism which allows them to report and analyse developments in the software industry, its products and languages.

One of the positions, depending on the candidate appointed, will take over a regular report written for programmers and concerned with all facets of their working life.

Both will involve a wide variety of news reporting on developments within software and in the computer industry generally.

The two vacancies represent a major opportunity in computer journalism on the biggest and most respected publication in the field. With a circulation of over 94,000, Computer Weekly is one of the leading titles of IPC Business Press, the world's largest publisher of specialist and trade journals. The job will be at the company's new head quarters in Sutton, Surrey, and offers the usual large company benefits.

Write to the Editor, explaining why you believe you have the skills for one of these openings and enclose a full cv and salary history. Mark this envelope 'confidential' and send to:

The Editor, Computer Weekly,  
IPC Business Press, Quadrant House,  
The Quadrant, Sutton, Surrey SM2 5AS.  
(4143)

**OPPORTUNITY**

Talented experts required in real-time Data Switching hardware/software design specialist shortly available for challenging (and well paid) international assignments collectively or individually. Agencies may apply.

For details apply to: CIVIC BOX 104

**IMMEDIATE CONTRACTS FOR PROGRAMMERS**

JORDAN  
BANBURY  
SAUND  
CROYDON  
NEB

CROYDON  
NEB

NEB

NEB

NEB

NEB

THE CHINESE UNIVERSITY OF HONG KONG

**LECTURER IN COMPUTER SCIENCE**  
(Re-advertise)

APPLICATIONS are invited for the above post tenable from August 1981. Applicants should have a higher degree (preferably a Ph.D) in Computer Science or related fields with appropriate university teaching and/or research experience. Preference will be given to applicants with experience in one or more of the following fields: Data base management systems, Computer operating systems, System simulation and modelling, Statistical computing, Compiler design or Operational research.

ANNUAL SALARY: HK\$95,700-160,080. Exchange rate approximately £1 = HK\$12. Starting salary will depend on qualifications and experience.

BENEFITS include superannuation (Universally 15% appointees 5%), medical benefits, paid long leave, education allowance for children and, for those employed on overseas terms, housing accommodation and air passage as well.

APPLICATION forms and further information are obtainable from the Personnel Section, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong. Completed forms together with copies of recent testimonials and one set of major publications should be returned before February 26, 1981. Please mark 'Application' on cover.

**URGENTLY WANTED: EXPERIENCED INFORMATICS SYSTEMS SW PROGRAMMER**

required: minimum 3 years of experience in compiler design and construction, Assembler and Pascal, creative and efficient practitioner. Experience in DEC PDP 11 desired but not absolutely necessary. Long-term job with top remuneration. Apply to ALKON AG ZURICH, Wurzenstrasse 83, CH-8047 Zürich, Switzerland. Tel: 01-362 00 00. Fax: 01-362 00 00. Telex: 820 200. (4143)



# MYRIAD

Outstanding opportunities exist for experienced Data Processing staff to play a significant part in the development of major international systems based on large IBM equipment. The company's European network links OSLO, STOCKHOLM, COPENHAGEN, VIENNA, MILAN, BRUSSELS, AMSTERDAM, PARIS, LONDON and currently vacancies exist in:

## ZURICH & DUSSELDORF

Joining specialist project teams, the successful candidates will be involved in the system design, specification and programming of several financial and marketing based applications making use of the European network.

### ANALYST/PROGRAMMERS ... TO £16,000

- ★ 3 YEARS' D.P.
- ★ SOUND COBOL KNOWLEDGE
- ★ PREFERABLY IBM OS
- ★ USER LIAISON EXPERIENCE
- ★ RELOCATION ASSISTANCE
- ★ MODERN OFFICES
- ★ INTERNATIONAL SYSTEMS DEVELOPMENTS

The company is one of the world's most successful international organisations and offers a secure and progressive future to people appointed. The vacancies offer the opportunity to enjoy a high standard of living and considerable potential for personal career development.

Ref. NJ/2201

MYRIAD APPOINTMENTS LIMITED  
30 Fleet Street London EC4Y 1AA Telephone 01-353 0981 24 hours

UNIVERSITY OF STRATHCLYDE  
Applications are invited for the post of  
**COMPUTER PROGRAMMER**  
in the MANAGEMENT SYSTEMS DIVISION of the UNIVERSITY AD MINISTRATION. The post will involve programming, COBOL or both real-time and the maintenance of existing systems. The University Administration operates a Host/Client system using a local system which provides both batch and interactive processing services throughout the university. The appointment will be for a period of 12 months to candidates with 2/3 years' programming experience and preferably one graduate or other qualifications in Computer Science.  
The appointment will be made on the Senior Administrative Staff Scale, £475-£595 per annum, under review, and will be according to qualifications and experience, USS basis.  
Application forms and further particulars (quoting R/101) and an envelope, a self-addressed envelope (9" x 4") may be obtained from the Academic Appointments Secretary, University of Strathclyde, Royal College Building, 204 George Street, Glasgow G1 1EW, with whom applications should be lodged by 30 January, 1981. (4138)

QUEEN MARY COLLEGE  
University of London  
Faculty of Engineering  
COMPUTER ASSISTED  
TEACHING UNIT  
**GRADUATE  
RESEARCH  
ASSISTANT**  
required to develop and implement computer based teaching materials. A degree in engineering science or mathematics essential, with experience in computer programming, preferably in FORTRAN, and an interest in educational innovation.  
The appointment, which may be suitable for a new/recent graduate, will be for two years' initially. Salary scale (under review) £6,000-£6,850 p.a. plus £100 conference allowances. Further details and application forms available from The Secretary, (CW), Queen Mary College, Mile End Road, London E1 4NS, to be returned by 15 February. (4100)

ESSEX COUNTY COUNCIL  
SOUTHEND COLLEGE OF  
TECHNOLOGY  
Cameron Road  
Southend-on-Sea  
Essex SS2 8LS  
Telephone: 0702 389281  
**LECTURER I-JIN COMPUTING**  
The post is available from 1st May 1981 but applications from those unable to take up duty until a later date will be considered.  
Candidates should have a degree or equivalent qualification in a relevant area. Ability to teach to G.C.E. 'A' level Computing essential.  
Salary Scale: £4,882-£6,055 per annum (under review).  
Further particulars and application forms from the Principal. (4105)

**SMR**  
Sales & Marketing Recruiters Ltd  
Victory House, 99 Regent Street, London W1R 7HB  
A Sales and Marketing Services Company  
London & Midlands

## Sales Executives

—with a talent for management  
Advance your career into large-scale mainframes

Our client is one of the world's foremost suppliers of mainframe computers; one of those names that gives real credibility to your curriculum vitae. This company has the qualities that well-informed, ambitious sales executives instinctively look for when seeking a career opportunity. Unquestionable market stature and product credibility, substantial and continuing investment in research and development, ongoing sales and product training (in the USA as well as the UK), positive opportunities for personal advancement and above all real commitment to the well-being of its employees and its clients.

We are seeking top-flight, proven senior sales executives, with at least three years experience of selling hardware based computer systems to major companies and institutions, for account management and high level sales negotiations, related to large-scale mainframe computer users. Job responsibilities will initially involve the protection, expansion and overall development of substantial existing installations, but new account selling will play an increasingly important role. These activities will demand the talent to develop and implement complex sales strategies at all levels of business operation.

The jobs are based in

### London

and on-target income is likely to be in excess of

**£18,000 + company car**

A minimum income guarantee will be negotiable for the first 12 months of employment.

Please provide complete career details to Alan Williams or Alasdair Scott quoting reference RBC/101.

Tel: 01-734 9776

Midlands and North - Lichfield 0543 215612  
Answering Service after 6 pm and weekends  
SALES TRAINING, MARKET RESEARCH, RECRUITMENT

**(SENIOR)  
SYSTEMS PROGRAMMER**  
**£7000 - £10,500**

Opportunities exist to join our newly formed team responsible for the installation, tuning and monitoring of system software. Scope is also likely to occur for a growing involvement in the field of capacity planning related to hardware, software, and user systems.

Applicants should have been engaged in DP for at least 2 years. Status and rewards will reflect the level of experience in systems programming and in particular with MVS, TSO and SMP. Knowledge of ACF/VTAM, IMS, VSPC and RACF would be an advantage although full training will be available.

Applicants should have a minimum of 12 months experience, preferably on IBM equipment using MVS.

COVENTRY CITY COUNCIL recently created a Computing Services Unit with over 150 posts in its 6 Divisions to manage the newly installed IBM3031 and its own system of systems. 725 and various Minis and Micros. The 3031 (4mb, 3610mb of 3550 discs) will be enhanced substantially over the next 4 years to meet considerable computing demands.

**SALARY AND CONDITIONS:** These posts are open to male and female applicants. We offer a salary negotiable within the ranges quoted, career development largely dependent on ability, job security, excellent holiday entitlements and a relocation expenses scheme.

WRITE TO: Head of Computing Services, Coventry City Council, Council Offices, Coventry CV1 5PO  
OR HING: Star Network on Coventry (020 8525 2227 for further details, an informal discussion, and an

**IBM OPERATORS**  
**£5200 - £6700**  
(including shift allowance)

These posts offer the chance to operate the new IBM 3031 and the established ICL system 4/72. They also provide opportunities for involvement in all aspects of the Operations function including networking, JCL preparation and problem determination. Training will be provided wherever appropriate.

Current shift arrangements comprise 1 (IBM) and 3 (ICL), with plans for work transfer to enable these to be replaced by 2 (IBM) and 2 (ICL) by the end of 1981.

Applicants should have a minimum of 12 months experience, preferably on IBM equipment using MVS.

## NEWBURY DISTRICT

COMPUTER SECTION

We are installing one of the new range high performance multi-purpose I.C.L. ME28/35 computers with the latest interface technology of systems from our existing 200/250 R.I. units, due to be completed by Berkshire County Council. To ensure maximum gain is obtained from our computer resources we have planned an interesting and varied programme.

We are looking for:

### PROGRAMMERS

£6,057 - £7,233  
The postholders will be required to have a detailed knowledge of COBOL programming and will join a small team involved initially in the transfer of systems to the ME28, and play an important part in the overall development of the computer service.

**WE OFFER:**  
A generous relocation scheme, including legal/estate agent fees to a maximum of £1,150, 100% removal expenses, disturbance allowance of £200, temporary permanent housing accommodation, temporary subsistence allowance, bridging loan facilities, canteen and recreation facilities, superannuation scheme and excellent working conditions.

For further information and application forms contact:  
Personnel and Management Services Unit  
Council Offices, Chancery Street  
Newbury, Berks RG1 1PL  
Tel: Newbury (0344) 22400 Ext. 285

**CLOSING DATE FOR RECEIPT OF APPLICATION FORMS:**  
First Post Monday, 27 February 1981  
(1000 hours)

**FERRANTI**  
Selling technology

## THE SALES BIT

### Common causes of failure in sales recruitment

LAST week I wrote about the common occurrence of sales recruitment failure, due primarily to a lack of urgency at branch sales management level. Of course, there are many other reasons why good candidates are lost; also a number of ways to raise the level of success.

While indecent haste is clearly to be avoided, there is no doubt that beyond an arbitrary point of two to three weeks' duration, the chances of recruiting a good candidate decline at an exponential rate.

In most cases the problem is a matter of priorities. Sales managers can easily delude themselves into believing that recruitment must have a lesser priority than sales activity and administrative process. This may be true for a while, but the price of delaying recruitment soon becomes very high; particularly in the new business sales.

Unrealistic requirements and procrastination are also significant causes of delay in the recruitment process.

Another reason for the failure of sales recruitment is the nature of the interview. Candidates often complain of unsatisfactory meetings, lacking in preparation and devoid of job specification or territory definition. This kind of situation can only serve to degrade both the manager and the job.

It is essential that all interviews are prepared and have a planned structure to cover all aspects of the job situation. They should also be backed by promotional literature. After all, the job interview is just another sales situation, but one where both are selling and both are buying.

Final closes and final closes are very much part of the action. If the deal feels right, ask for the order!

The chosen method of recruitment can also lead to delay and failure. Sometimes, companies in a hurry to recruit decide to shop around the agencies; rather than establish their own customised campaign. The belief is that the immediate availability of candidates from agency files will speed up the procedure. Sometimes, the reverse is true. Some of the candidates in their present job or next job vacancy he has is his own.

The best kind of respondents to recruitment advertising are often those who have not definitely decided to change their employment. Their attention was caught by an advertisement and they decided, perhaps on impulse, to discover more about the job in question. Eventually, he gets into the unrecovable position of being unable to compensate for the revenue loss brought about by an untrained territory. It is then likely that the next job vacancy he has is his own.

The chosen method of recruitment can also lead to delay and failure. Sometimes, companies in a hurry to recruit decide to shop around the agencies; rather than establish their own customised campaign. The belief is that the immediate availability of candidates from agency files will speed up the procedure. Sometimes, the reverse is true. Some of the candidates in their present job or next job vacancy he has is his own.

The best kind of respondents to recruitment advertising are often those who have not definitely decided to change their employment. Their attention was caught by an advertisement and they decided, perhaps on impulse, to discover more about the job in question. Eventually, he gets into the unrecovable position of being unable to compensate for the revenue loss brought about by an untrained territory. It is then likely that the next job vacancy he has is his own.

The best kind of respondents to recruitment advertising are often those who have not definitely decided to change their employment. Their attention was caught by an advertisement and they decided, perhaps on impulse, to discover more about the job in question. Eventually, he gets into the unrecovable position of being unable to compensate for the revenue loss brought about by an untrained territory. It is then likely that the next job vacancy he has is his own.

The best kind of respondents to recruitment advertising are often those who have not definitely decided to change their employment. Their attention was caught by an advertisement and they decided, perhaps on impulse, to discover more about the job in question. Eventually, he gets into the unrecovable position of being unable to compensate for the revenue loss brought about by an untrained territory. It is then likely that the next job vacancy he has is his own.

The best kind of respondents to recruitment advertising are often those who have not definitely decided to change their employment. Their attention was caught by an advertisement and they decided, perhaps on impulse, to discover more about the job in question. Eventually, he gets into the unrecovable position of being unable to compensate for the revenue loss brought about by an untrained territory. It is then likely that the next job vacancy he has is his own.

The best kind of respondents to recruitment advertising are often those who have not definitely decided to change their employment. Their attention was caught by an advertisement and they decided, perhaps on impulse, to discover more about the job in question. Eventually, he gets into the unrecovable position of being unable to compensate for the revenue loss brought about by an untrained territory. It is then likely that the next job vacancy he has is his own.

The best kind of respondents to recruitment advertising are often those who have not definitely decided to change their employment. Their attention was caught by an advertisement and they decided, perhaps on impulse, to discover more about the job in question. Eventually, he gets into the unrecovable position of being unable to compensate for the revenue loss brought about by an untrained territory. It is then likely that the next job vacancy he has is his own.

The best kind of respondents to recruitment advertising are often those who have not definitely decided to change their employment. Their attention was caught by an advertisement and they decided, perhaps on impulse, to discover more about the job in question. Eventually, he gets into the unrecovable position of being unable to compensate for the revenue loss brought about by an untrained territory. It is then likely that the next job vacancy he has is his own.

## Puzzle Answer

The sequence has been made up by expressing it in descending base, starting with 1000 in base 2.

## CONTRACTS

C. £325 to  
£900 p.w.k.

IMMEDIATE to  
APRIL start

Midlands/H.C.	PDP11 RFXIIM MACRO II	Programmers
London/Midlands	M 8800 or INTEL 8086	Programmers
London/H.C.	VAX or PDP11 RTL/2	Designers/Programmers
U.K.	IMS or DL/1 VSAM	Database Designers
U.K.	FINANCIAL	Analysts
U.K.	JMS DB/DC PL/1	Analysts/Programmers
U.K.	CICS, DL/1 COBOL or TL/1	Analysts/Programmers
London/H.C.	IMS DB, ADF COBOL	Snr. Programmer
London/H.C.	H66 FORTRAN or COBOL	Programmers
London/North	SYS 34 or 2903 RPG II	Programmers
London	NCR NEAT II	Programmers
London/W. GERMANY	OS MVS	JCL Writers
London/W. GERMANY	MFT/MVS Conversion	Systems Programmers
London/H.C.	SERIES 1 RPS COBOL	Programmers
London	B100 DPFX COBOL	Programmers
W. GERMANY	PRIME 300, COBOL	Analysts/Programmers
HOLLAND	DATABASE	Consultant
W. GERMANY	PL/M—PROCESS CONTROL	Software Engineers
HOLLAND	DIGITAL TELECOMS	Analysts/Programmers
	PDP11/VAX RTL/2	

To register your interest phone JANET — 021-622 3040

(4200)

## REAL TIME CONSULTANTS

Monaco House, Bristol Street  
Birmingham B5 7AS  
Telephone 021-622 6181-2 or 622 3040 (24 hrs)

## SHAPE TECHNICAL CENTRE THE HAGUE (HOLLAND)

SHAPE Technical Centre — a NATO Research Organisation — has a vacancy for a

## SENIOR SYSTEM PROGRAMMER

INITIAL SALARY DG.37,125  
NET PER ANNUM

for its Control Data Cyber 740 computer system. The successful candidate should have broad experience in data processing with at least three years' in systems programming for a CDC Cyber/6000 computer system.

Good knowledge of programming in high-level languages and macro-assembler at the operating system level is required.

Starting salaries will depend on qualifications and experience and may be increased dependent on the family situation.

Applicants (NATO nationals only) should send a brief personal résumé to Personnel Officer, SHAPE Technical Centre, P.O. Box 174, 2501 CD The Hague, The Netherlands.

(4207)

## IMS Systems Programmer

### Amsterdam-1 year

£19,000+p.a.

Initial posting  
We are seeking a systems programmer with one or more years' IMS experience. The initial assignment is to spend one year working as a member of a 3-man team in the Netherlands. The other team members consist of a senior systems programmer and a trainee, and the specific duties to be performed include generating and maintaining 1.1.6; planning for and implementing 1.2; providing advice and support to application development teams; and assisting in the evaluation of new DB/DC facilities and load, with links to internal and external networks.

### IMS DB Support

### Netherlands-9 months+ £19,000+p.a.

Initial posting  
We are seeking an IMS specialist with a good understanding of IMS database design and familiarity with DBA 202. The initial assignment is to work for a client company in the Netherlands, assisting in the implementation of IMS 1.1.6/DBA 202 and installing an IMS 1.2 system. General system tuning on a 4000-8M DBMS. Duties will include database design for existing standards and procedures, and the provision of training and technical support to application development groups.

CDS is a strong Anglo-Swiss consultancy specialising in providing Systems Programming, Database and Telecommunications support to European IBM users. The majority of our staff are employed by CDS of Zurich, but we are also prepared to offer full employment with international consultancy.

For further details of these positions, please telephone or write to Jim Shaw at our UK office, or write during working weeks and evenings to CDS, 100-102 Grosvenor Gardens, London SW1, or to Jim Shaw at our Zurich office.

The CDS System  
Southwark Specialists

100-102 Grosvenor Gardens, London SW1

Telephone 01-730 4646

## PUT YOUR FUTURE IN THE LAP OF THE GODS!

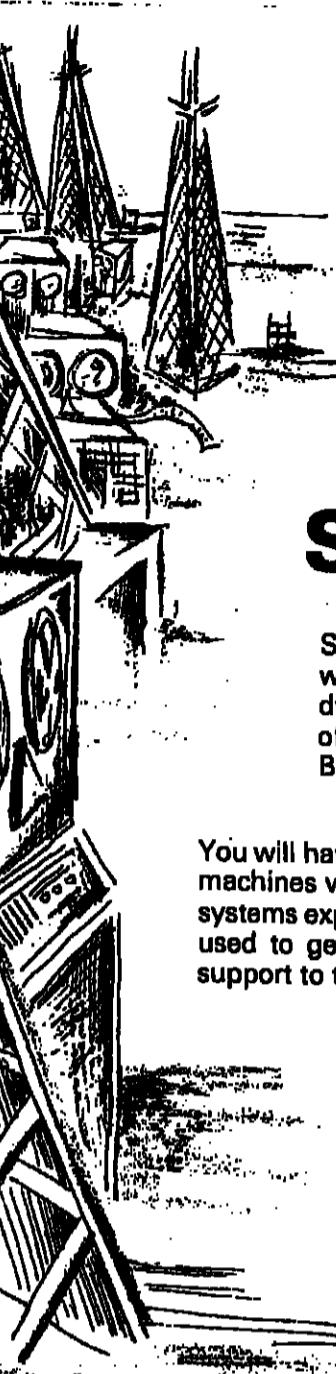
ZEUS-HERMES RECRUITMENT LTD., provides a specialist recruitment service, finding suitable appointments for Data Processing Professionals for either permanent or contract positions.

Complete and return the coupon below, and...

—Don't just trust to luck!

Name:	Address:
Home Tel:	Work Tel:
Present salary:	Salary sought:
Present position:	
Position sought:	
Years in D.P.:	
Main Machine(s):	
Other Languages(s):	

ZEUS-HERMES RECRUITMENT  
TELEPHONE (01-386) 01124 (24 HOUR SERVICE) OR WRITE  
ZEUS-HERMES, FREEPOST, LONDON W1E 4Y2



## THE DEVELOPMENT OPPORTUNITY IN KENT FOR AMBITIOUS SYSTEMS PROGRAMMERS

Seismograph Service Ltd. are a major force in the seismic surveying field. Their operations are world wide and their computer utilisation ensures that they remain in the forefront of this dynamic area. As you will appreciate, it is an area of rapid and continuous growth and because of this, they need an ambitious systems programmer to join their professional team at BROMLEY.

You will have a science degree and at least 2 years' systems programming experience on DEC machines with a sound knowledge of ASSEMBLER. Preferably, you will have VAX operating systems experience and a wish to develop that experience on 11/780 equipment. You will be used to generating, maintaining and tuning systems and will be willing to give software support to the engineers on the ARRAY PROCESSOR.

You will want a career in the industry of the future and the following benefits:

- ★ A salary to £10,000
- ★ Subsidised canteen
- ★ Very attractive surroundings
- ★ Brand new offices
- ★ A superb training
- ★ A well-defined career path

Interested, then contact:

TUNBRIDGE WELLS 35712/3 (0892) (24-HOUR SERVICE)

(4142)



RECRUITMENT AGENCY

14 MOUNT PLEASANT, TUNBRIDGE WELLS, KENT  
TELEPHONE TUNBRIDGE WELLS 35712/3/4

## SAUDI ARABIA

We are seeking the following staff for bachelor status contracts:

### Analyst Programmers

With approximately 3 years experience of IBM computers Cobol and JCL. Also be able to design programs, program maintenance and develop systems feasibility. (Ref: 6E)

### Operation Restart

### and Recovery Specialist

3 years experience in the restart of onsite production job queues and the operation of a master terminal for online telecommunications facility. (Ref: 5E)

For application form ring Gordon Newton on 01-222 1677, or write to 'Lansdowne (Middle East) Ltd., c/o Lansdowne House, 36 Great Smith Street, Westminster, London SW1P 3BL.'

### DEPARTMENT OF FINANCE

## COMPUTER SHIFT LEADER

Grade T3/4  
Salary £9,178-£9,837 plus 14% shift allowance

The council currently operates an I.C.L. 1802T computer running under George 2+ with several on-line applications.

A Honeywell 154/DP8 2 is due for delivery in 1981 as a replacement for the 1802T.

The successful applicant will be expected to play a substantial role in the transfer of work from the present equipment to Honeywell installation and a knowledge of the G.C.O.S. operating system is desirable.

Applicants must have at least two years' operating experience and be capable of accepting high levels of responsibility during alternating shifts.

Application forms available from the Chief Personnel Officer, Civic Centre, Millgate, Wigan, Tel. Wigan 44891, ext. 43. Closing date: January 20, 1981.

(3971)

Metropolitan Borough of WIGAN

POLYTECHNIC OF CENTRAL LONDON  
SCHOOL OF ENGINEERING AND SCIENCE  
The PCL has established itself as one of the leading institutions in computer education. The first year enrolments in Computing courses from HND to MSc Computer Science are at an all time high. The PCL has a well equipped computer centre.

The work load relating to the post would principally be that of leading the commercially oriented courses, with lecturing, research and consultancy.

It is essential that the successful applicant has a sound knowledge of professional standards of programming for commercial applications in COBOL, PASCAL, etc.

III systems technology for huge filing systems

IV data processing applied to business

IV word processing.

LECTURER II/SENIOR LECTURER IN DIGITAL SYSTEMS AND MICROCOMPUTER ENGINEERING

SALARY: £1,077-£1,048.61, GL C0711-11158 (BAR) - £1,204 (inclusive of London Allowance).

The post involves lecturing with other hardware or software packages and will be concerned with the teaching of computer technology, basic and graduate computer technology, teaching in the School of Engineering and Science, Research/consultancy and short course generation.

The successful applicant will be expected to make full use of the facilities available in these ancillary areas.

Further information and application forms from the Establishment Office, The Polytechnic of Central London, 308 Regent Street, London, W1R 8EE. Closing date January 20th, 1981. Phone 01-580 0232 Ext. 12.

(4046)

## GUIDE TO RECRUITMENT CONSULTANTS IN THE U.K.

## LONDON & H. COUNTIES (LH), MIDLANDS (M), NORTH (N), SCOTLAND (S), OVERSEAS (O)

### NORTHERN IRELAND

### ALL COMPUTER STAFF NEEDS

### RECRUITMENT CONSULTING DIVISION

### 82 Shaftesbury Avenue, London W1V 7DE

01-734 8822 (24 hour service)

P.O. Box 63, Copthall Tower, House

Harrow HA1 1TS. Tel: Harrow 0882 8822

(2042)

### Computer Professional Recruitment Consultancy

"COMPUTER PROFESSIONALS — MAKE  
SURE WE HAVE YOU IN MIND"

Westgate House, 100-102 Grosvenor Gardens, London SW1

Telephone 01-730 4646

Evening Section 01-730 4646

Telex 838 600

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646

01-730 4646